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W. A. KELLERMAN

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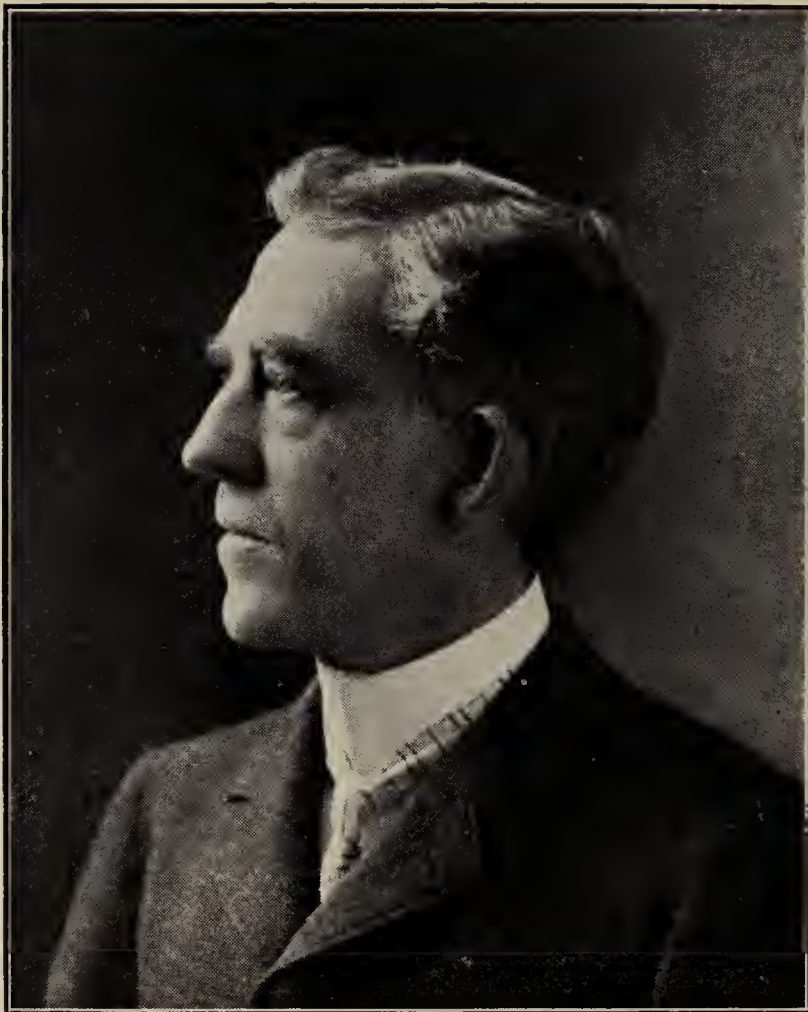
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A NEW SIROTHECIUM.

A. P. MORGAN.

SIROTHECIUM FRAGILE MORGAN sp. nov.—Perithecia superficial, globose or obovoid, crowded together on a thin white subiculum; the wall smooth, black, fragile, the upper part very thin and evanescent, the lower portion thicker and more persistent, supporting as in a cup the brown globular mass of spores. The inclosed hymenial hyphae, at maturity, wholly abjointed into long slender, branched chains of spores. Spores short-cylindrical, obtuse at both ends, smoky-pellucid, 4-5 x 2 mic.

Growing on old wood of Nyssa, Preston, O. Dec. 1903.

Perithecium 100-125 mic. in diameter; the wall breaking up irregularly, the upper portion soon disappearing.

The resemblance of this species to the obscure Bloxamia is very striking, but the spores are not "generated in closely packed tubes." See Cooke's Handbook page 934.

PROOF OF THE IDENTITY OF PHOMA AND PHYLLOSTICTA ON THE SUGAR BEET.

GEO. G. HEDGCOCK.

It has been asserted repeatedly during the past decade by leading phyto-pathologists of Europe that the *Phyllosticta* leaf blight and the *Phoma* root rot of the sugar beet were caused by the same fungus, but no cultural proof accompanied by inoculations has been made to establish the assumption. In order to ascertain the truth or falsity of such assertions, and also to try to discover if these imperfect fungi do not have perfect forms in their life cycle, an investigation was begun three years ago and continued intermittently till the present.

A large number of cultures have been made from sugar beets decaying with the typical black crown rot caused by *Phoma*, and from the peculiar concentric brown leaf spots produced by *Phyllosticta* upon the leaves of this plant. Pure cultures were isolated and grown under similar conditions both in test tubes and in Petrie dishes upon various agar and gelatin media and upon a number of vegetables. In all about fifty sets of cultures have been made. Although some variation of cultural characters was noted upon different media and under different physical conditions, the cultures from the two sources were similar when grown under the same conditions showing no distinct variation of the mycological characters, such as the color, dimension, and gross appearance of the spores, pycnidia and mycelium.

For the purpose of more certainly proving the identity of the two fungi, sugar beet plants were grown in the green house as follows for the purposes of inoculation. Sugar beet seeds were sterilized by placing them in concentrate sulphuric acid for thirty minutes then washing them thoroughly in sterile water and neutralizing the acid remaining in the seed coat by adding a ten per cent. solution of potassium hydroxide for a few minutes, then again washing in sterile water. These seeds were then placed in pots of soil which had been sterilized by heating to 100 degrees Centigrade for three hours upon three successive days. The plants from these seeds were grown in the greenhouse partly in the open and partly in a closed case. They were apparently free from either leaf blight or root rot fungi. Twelve plants were inoculated with *Phoma* and twelve with *Phyllosticta*, a similar number being used as a control. Similar leaf spots appeared in about three weeks upon both sets of inoculated plants, the control plants remaining free from disease. From both sets, leaf spots bearing mature pycnidia were taken and the fungus was isolated again and grown in pure cultures with the same results as before.

Beets whose roots were sound and healthy but whose leaves were diseased by *Phyllosticta* were placed during December,

1901, in a moist silo, and at the same time others were put in a dry cellar, those in the latter being examined from time to time. The basal portions of the petioles of the diseased leaves were left attached to the crown of each beet. In a month or so the petioles had been partially or wholly rotted by the *Phyllosticta* and in two months the decay had penetrated the crowns of the beets producing the typical *Phoma* rot. Cultures carefully removed with a hot scalpel from the interior portions of the diseased tissues of the petioles and roots developed cultures of *Phoma*.

In the study of cultures of the fungus from both leaves and roots, under certain conditions there were produced guttulated spores, but normally in either case the spores were free from either guttules or oil globules. This work indicates that in the case of the beet we have only one species of fungus which according to priority of generic names will be placed in the genus *Phoma*, and that the various species of *Phoma* and *Phyllosticta* described upon sugar beets, garden beets and mangels are identical. A synonymy of names will be published later.

Mississippi Valley Laboratory, St. Louis, Mo.

NOTE ON THE GENUS HARPOCHYTRIUM.

GEO. F. ATKINSON.

At the suggestion of the editor I have prepared this short note on the genus *HARPOCHYTRIUM* for the *JOURNAL OF MYCOLOGY* — for the purpose of calling the attention of American students to these interesting Chytrids, to give brief characters of the genus, and the at present three species. I have also added a brief suggestion or two not brought out in my monographic treatment of the genus.¹

In that paper I have described the development, formation of sporangia, formation and movement of zoospores, attachment to host, parasitism, relationship of forms, origin and distribution of species, and synonymy.

The genus is one of the *Chytridiales* and is probably best located in the family *Rhizidiaceae*. The plant body is elongated, narrowly fusiform, usually tapering to a point at the free end, but often more or less rounded at the basal end. Some of the individuals are straight but more often they are curved, sometimes strongly so. The plant is either sessile or attached to the host by a very short, slender stalk, or by a more or less elongated

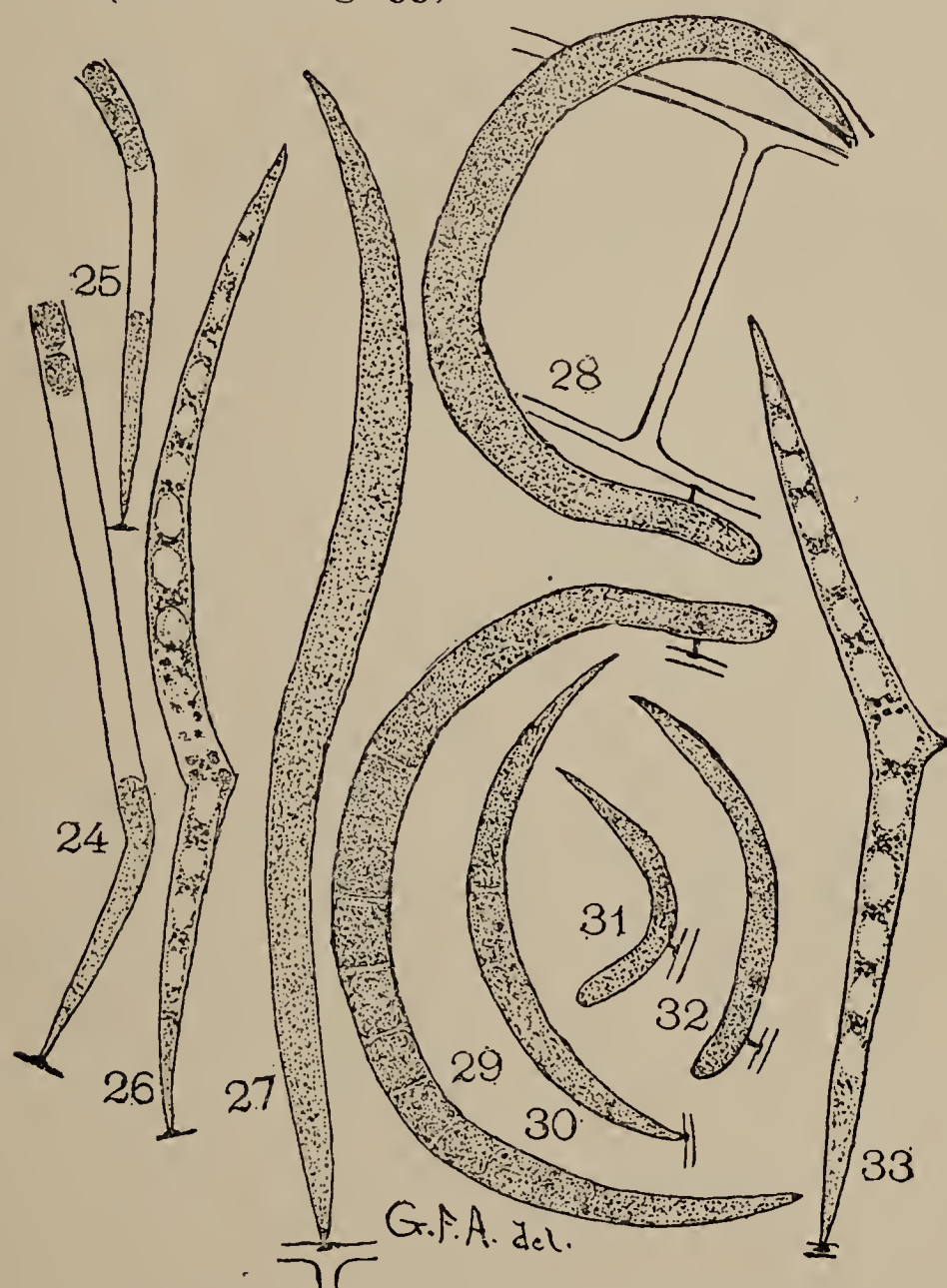
¹The Genus *Harpochytrium* in the United States, *Ann. Mycol.* 1: 479-502, Pl. 10 and text Figures A-F, November 1903. [Ausgegeben am 10. December 1903.]

stalk, the latter being formed when the zoospore is prevented from coming in contact with the host cell by an envelope of gelatine with which some algae are provided. Even in the apparently sessile forms there is a short slender stalk which pierces the outer lamella of the host cell wall. The stalk expands into a disk shaped holdfast in the middle lamella, but in the smallest species this has not been certainly determined. When the plant is mature it is divided by a thin cross wall near the base into a small sterile basal part, and an outer long part, the sporangium. The tip of the sporangium gelatinizes and permits the escape of the zoospores which are oval and 1-ciliate. The zoospores either swim about with great rapidity in the water, or first show slight amoeboid movements, and then dart off with great rapidity, and finally come to rest on the host or in the gelatinous sheath surrounding the host, and attach themselves. The sterile base now forms a secondary sporangium in the empty one, and this may be repeated several times as in *Saprolegnia*. The plant probably is not derived from *Saprolegnia* by degeneration, but more likely is an example of the differentiation of a simple chytrid into a sterile and fertile part, the sterile part perhaps representing a rudimentary hypha.

My first knowledge of the genus was in 1896, when I found it at Ithaca, N. Y., parasitic on *Spirogyra* and rarely on *Zygnema*. This species proved to be *Harpochytrium hedenii* Wille, which has also been found in France, Tibet (Asia), and Patagonia (S. Am.), and Sweden.

Since the publication of my paper in the *Annales Mycologici* (1. c.) I have received drawings of a species of *Harpochytrium* from Dr. Lagerheim, a notice of which it seems desirable to incorporate in this note. His pencil sketches I have redrawn and they are here reproduced in text figures 24-26. These plants were growing on threads of *Vaucheria*. They are interesting as showing from the illustration that the base of the organism does not penetrate the cell wall, but expands into a disk-like holdfast and absorbent plate on the outer surface of the wall. This may be because of some peculiarity of the cell wall of the host. I am inclined to think that in some cases the form from Tibet is furnished with the disk-like holdfast on the outside of the cell wall, especially in the forms on threads of *Zygnema* which are covered with a thin slime layer. The slime would tend to prevent the zoospore from coming in contact with the cell wall directly and a very short slender stalk is developed to reach the host just as a longer stalk is developed in *H. hyalothecae* on the desmids with a thick slime layer. Text figure 26 represents a peculiar form of the plant, with a tendency to develop a short conic out-growth at one side as if there was a tendency to branch. A similar form I found in 1896 at Ithaca, but for

which there was not room in the Plate illustrating my paper in the *Annales* (see text Fig. 33).



HARPOCHYTRIUM HEDENII Wille. Figs. 24-26, on *Vaucheria*, Sweden; 27, 28, on *Zygnema*, Patagonia; 29-32, on *Zygnema*, Tibet; 33, on *Spirogyra*, United States.

These specimens from Dr. Lagerheim I think without doubt belong to *H. hedenii*. They were found growing on *Vaucheria* in an aquarium in the Botanical Institute of the Högskolan, Stockholm. Several years earlier Dr. Lagerheim found what he thinks the same organism on *Microspora stagnorum* in Stads-hagen in Stockholm. He has searched again this last autumn for the same but the locality is so changed he was not able to find a trace of it. Dr. Thaxter of Harvard University informs me that he has found a species of *Harpochytrium* (which I suppose is *H. hedenii*) on *Saprolegnia* in Cambridge, Mass.

With regard to the wide distribution of *H. hedenii* some would probably attribute the forms in such widely separated areas as Tibet, Patagonia, and the United States, as due to a polyphyletic origin. It seems more reasonable, however, to regard them as having a common origin. I have shown in my

paper (l. c.) how it is quite possible that in Tertiary times the species could easily have passed from Europe to North America or *vice versa*. It is very likely that in even earlier times the condition of climate and topography of the two hemispheres might have been such as to have caused a wide distribution north and south before the modern types of the higher plants were evolved. The forms from Patagonia are shown in text Figures 27, 28, and those from Tibet in text Figures 29-32. The latter show peculiar variations in form.

The species on which the genus was founded in 1890 by Lagerheim is *H. hyalothecae*, found on *Hyalotheca dissiliens* (consult the accompanying Plate). It was later found by Gobi in Finland, and by myself at Ithaca, N. Y., in 1903. At the same time (1903) the new species *H. intermedium* was found. Bibliographic references concerning the above species are given in the brief description of species at the close of this paper.

The plants seem to show some relationship to such forms of the genus *Rhizophidium* as *R. lagenula* (A. Braun) Schroeter,² and the example of *Chytridium lagenula* A. Braun³ which he figures on *Conferva floccosa* (*bombycina*) looks very much like a young form of *Harpochytrium hedenii* Wille, but the description and figure are too imperfect to be certain, while the mature forms of *C. lagenula* on *Melosira varians* are quite certainly generically distinct, as is also *R. fusus* Zopf.⁴

Gobi⁵ thinks the organism is an animal belonging to the *Flagellates*, and that algae like *Characium*, *Ophiocytium*, and *Sciadium* have been evolved from it. Wille,⁶ while agreeing with Gobi that it shows a phylogenetic relationship with such algae, believes it is a chlorophyllless alga derived from the green forms, much as he thinks the chlorophyllless form *Chionaster nivalis* (Bohlin) Wille (*Cerasterias nivalis* Bohlin)⁷ has been derived by descent from the chlorophyll bearing genus *Tetraedon*. It does not seem necessary, however, to search in either of these directions for the relationship of the genus since a more probable and closer relationship exists with such species of *Rhizophidium* as I have mentioned above. A consideration of all the facts seems also to show that the organism is one of the *Chytridiales*, and the

² Rab. Krypt. Flora, 4, p. 99.

³ A. Braun. Ueber Chytridium eine Gattung einzelliger Schmarotzer gewächse auf Algen und Infusorien. Abhandl. d. k. Akad. f. Wiss. zu Berlin, pp. 21-83, Taf 1-4 (1885), 1856.

⁴ Nova Acta physico-medico=Verhandl. d. Leopold. Car. Acad. d. Naturforscher, 47, p. 199, Tab. 18, Fig. 9-12, 1884, Nuernberg, Erlangen, etc.

⁵ Gobi, Chr. Fulminaria mucophila, Nov. gen. et sp. Script. Bot. Hort. Univ. Imp. Petrop. Fascic. 15, pp. 283-292, Tab. VII, Fig. 1 & 2, 1899.

⁶ Willie, N. Ueber Cerasterias nivalis Bohlin. Nyt Mag. f. Naturvidenskab. 41, pp. 171-176, 1903.

⁷ Bohlin, K. Snöalgen från Pite Lappmark, Botaniska Notiser, Lund. 1893.

peculiar proliferation of the sporangia is known in at least one other genus of chytrids, in *Cladochytrium*, according to Nowakowski⁸ in *Cladochytrium elegans* (Tab. 6, Fig. 14-17) and according to Clinton in *Cladochytrium alismatis*.⁹

Brief characterizations of the species might be given here with synonymy.

1. HARPOCHYTRIUM HYALOTHECAE Lagerheim, Hedw., 29, 142, 143, 1890. Plant body 20-60 μ x 1.5-2 μ attached at the basal end by a long and very slender stalk since the hosts are covered by a thick gelatinous layer; the base of the plant body is within the slime while the larger part projects beyond; fusoid and slightly curved, either projecting straight from the stalk, or bent, sometimes nearly to a right angle with it. Zoospores in one row, correspondingly small. Syn., *Harpochytrium hyalothecae* Schroet. in Rabh. Krypt. Flora 4. Pilze, p. 114, 1892; *Fulminaria mucophila* Gobi, Script. Bot. Fasc. 15, 283-292, 1899; *Fulminaria mucophila* Wille, Nyt Mag. f. Naturvidenskab. 41, p. 175, 1903. Distribution, on *Hyalotheca dissiliens*, in Finnland, Sweden and U. S. of North America (Ithaca, N. Y.) and on *Sphaerosoma vertebratum*, *Cosmocladium* species, *Dictyosphaerium* species, Finnland.

2. HARPOCHYTRIUM HEDENII, Wille, Petermann's Mitteilungen, Erg.-Heft no. 131, S. 371, 1900. Plants 80-180 μ x 4-10 μ the larger diameter accompanying the longer forms. Zoospores usually in a single row, 4-6 μ , but in the broader forms in two to three rows. Plant sessile or with a very short stalk on some species of *Zygnema* perhaps those species which have a thin gelatinous envelope (I have found that many of the threads of *Zygnema* from the Tibet material have a thin gelatinous sheath). Syn., *Rhabdium acutum* Dangeard, Ann. Mycol. 1, 61-64, 1903; *Fulminaria hedenii* Wille, Nyt Mag. f. Naturvidenskab. 41, p. 175, 1903. Distribution, on *Spirogyra* and *Oedogonium*, France; on different species of *Spirogyra*, rarely on *Zygnema*, rarely on *Harpochytrium hedenii*, U. S. of North America (Ithaca, N. Y.); on *Zygnema* and *Spirogyra* in Tibet, Asia; and on *Zygnema* in Patagonia, S. Am.

3. HARPOCHRYTRIUM INTERMEDIUM Atkinson, Ann. Mycol. 1, 494 & 500, Pl. 10, Fig. 22, 23. 1903. Plant body 40-70 μ x 3-4 μ narrowly fusoid, straight or slightly curved, sessile. Zoospores in one row, correspondingly small.

EXPLANATION OF PLATE.

(Plate reproduced from the November No. of Annales Mycologici.)

HARPOCHYTRIUM HEDENII Wille.

Figs. 1, 2, 3, 4, 5, Young stage of plant on *Spirogyra* and *Zygnema*, developed in cell culture.

Fig. 6, Mature plant.

Fig. 7, Old plant with two empty sporangia and young tertiary sporangium growing out in the old secondary one.

Figs. 8, 9, Plants half grown showing large and long vacuoles separated by granular protoplasm. Both of these plants became freed from their attachment to the host, the one illustrated in Fig. 8 was attached at two points, one point directly at the base, the other upon the side a short distance from the end. The plant in Fig. 9 was attached at one point on the side, a little distance from the end. Here the short slender stalk and the disk-like expansion is shown. The plants are usually attached directly at the end, but in some cases, probably where the zoospore rests at first against the host cell on its side, the haustorium and absorbent disk are formed on the side.

Fig. 10, Plant coiled in the form of a serpent on the side of the *Spirogyra* thread.

Fig. 11, Old plant with empty sporangium and young secondary sporangium developing within.

⁸ Nowakowski, L. Beiträge zur Kenntnis der Chytridiaceen. Cohn's Beitr. z. Biol. d. Pflanzen, 2, p. 72-100, Tab. 3-6, 1876.

⁹ *Cladochytrium alismatis*. Bot. Gaz., 33, pp. 49-61, pl. 2-4, 1902.

- Fig. 12, Mature plant, zoospores escaping, sterile basal part limited by thin wall which is arched outward slightly because of the endosmotic pressure in the protoplast, and the removal of the pressure within the primary sporangium.
- Fig. 13, One individual of *Harpochytrium* attacked by another, the parasitic one only half the size and age of the host individual.
- Fig. 14, Later stage, showing degeneration of the host individual and the increased size of the parasitic individual.
- Fig. 15, Mature individual attached at the side a short distance from the base.
- Fig. 16, Mature individual attached at the end at a point between two adjacent *Spirogyra* cells.
- Fig. 17, Same plant with zoospores escaping. This plant was kept in cell culture and the secondary sporangium from the sterile basal part began to grow before the developed zoospores escaped, and was forced out slightly at one side. The apex of individuals in Figs. 15, 16, show the peculiar condition shortly before formation of zoospores. In Fig. 17, amoeboid movement of some zoospores shown in the sporangium and also escaping.
- Fig. 18, The zoospore after escaping from sporangium still showing amoeboid movement.
- Fig. 19, Five individuals showing stages in attachment and elongation of zoospores. Figs. 6, 7, 11, 12, 13, 14, show the disk-like holdfast and absorbent disk between the outer and inner lamellae of cell wall.
- Figs. 1-19 from specimens collected at Ithaca, N. Y.
- Fig. 24, after Dangeard.

HARPOCHYTRIUM HYALOTHECAE Lagerheim.

- Fig. 20, Showing two young individuals attached to cell of host (*Hyalotheca dissiliens*), one of the zoospores still within the slime and just having developed the slender stalk; the other individual, the zoospore having elongated and the outer end projecting beyond the slime sheath.
- Fig. 21, Mature individual attacked by a filamentous bacterium.
- Figs. 20, 21, from specimens collected at Ithaca, N. Y.
- Fig. 25, after Gobi.
- Fig. 26, after Lagerheim.

HARPOCHYTRIUM INTERMEDIUM Atkinson.

- Fig. 22, Half grown individual attached to *Conferva utriculosa*, showing disk-like haustorium between outer and inner lamellae of cell wall.
- Fig. 23, Mature individual with empty primary sporangium, and young secondary sporangium developing.
- Figs. 22, 23, from material collected at Ithaca, N. Y.

CULTURES OF UREDINEAE IN 1903.¹

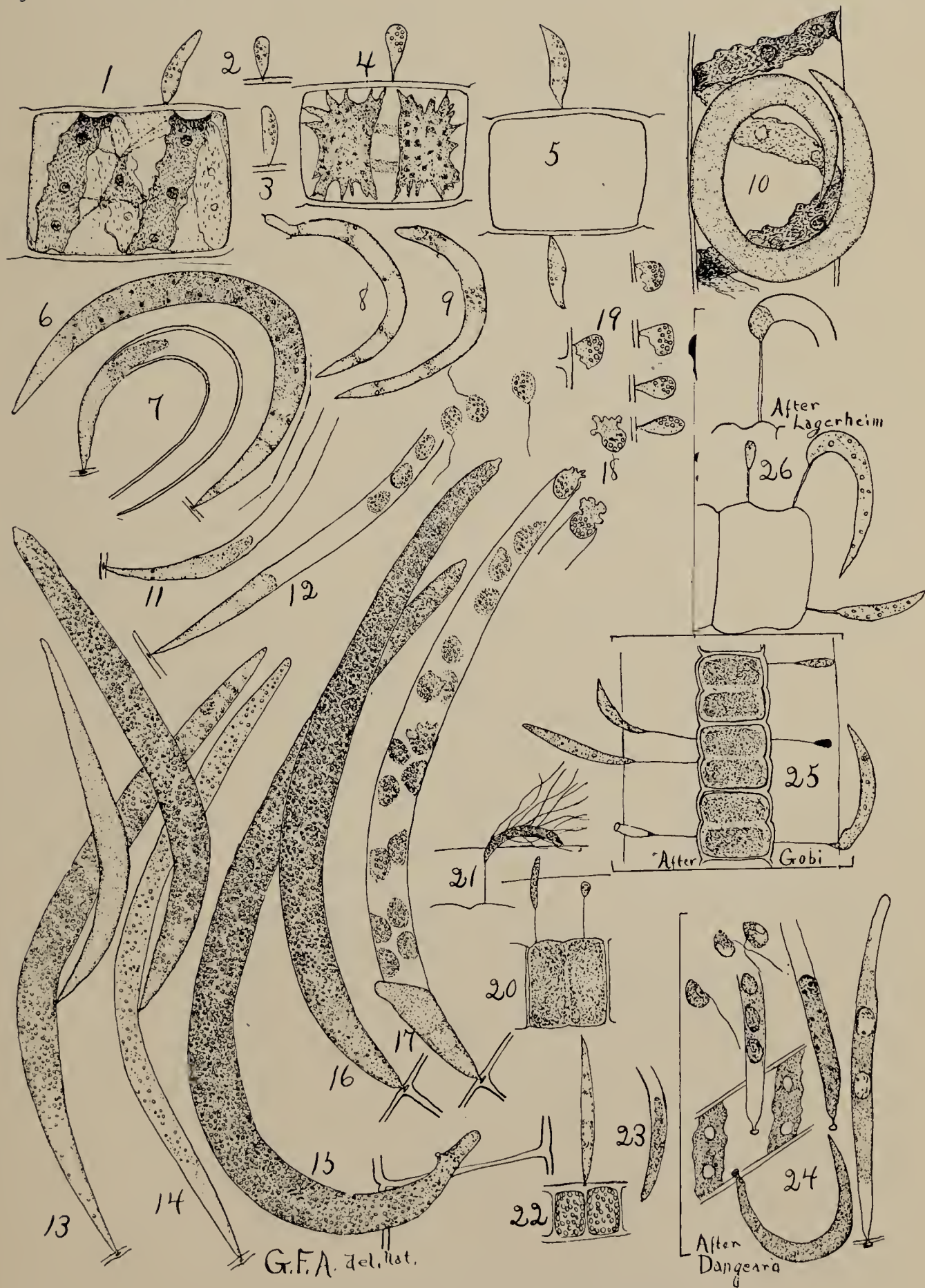
J. C. ARTHUR.

The present article forms the fourth of a series of reports² by the author upon the cultures of plant rusts. They cover the years from 1899 to the present inclusive. This report is devoted both to autoecious and heteroecious species, among which the grass and sedge rusts have had a prominent place. The number of species studied and the number of cultures made have fallen off somewhat from last year, partly because it was late in the spring before assistance was secured to carry on the work, and partly because a less number of collections of teleutospores and field observations were obtained upon which to base the work. The results however, fully equal in interest and importance those of last year, or possibly exceed them.

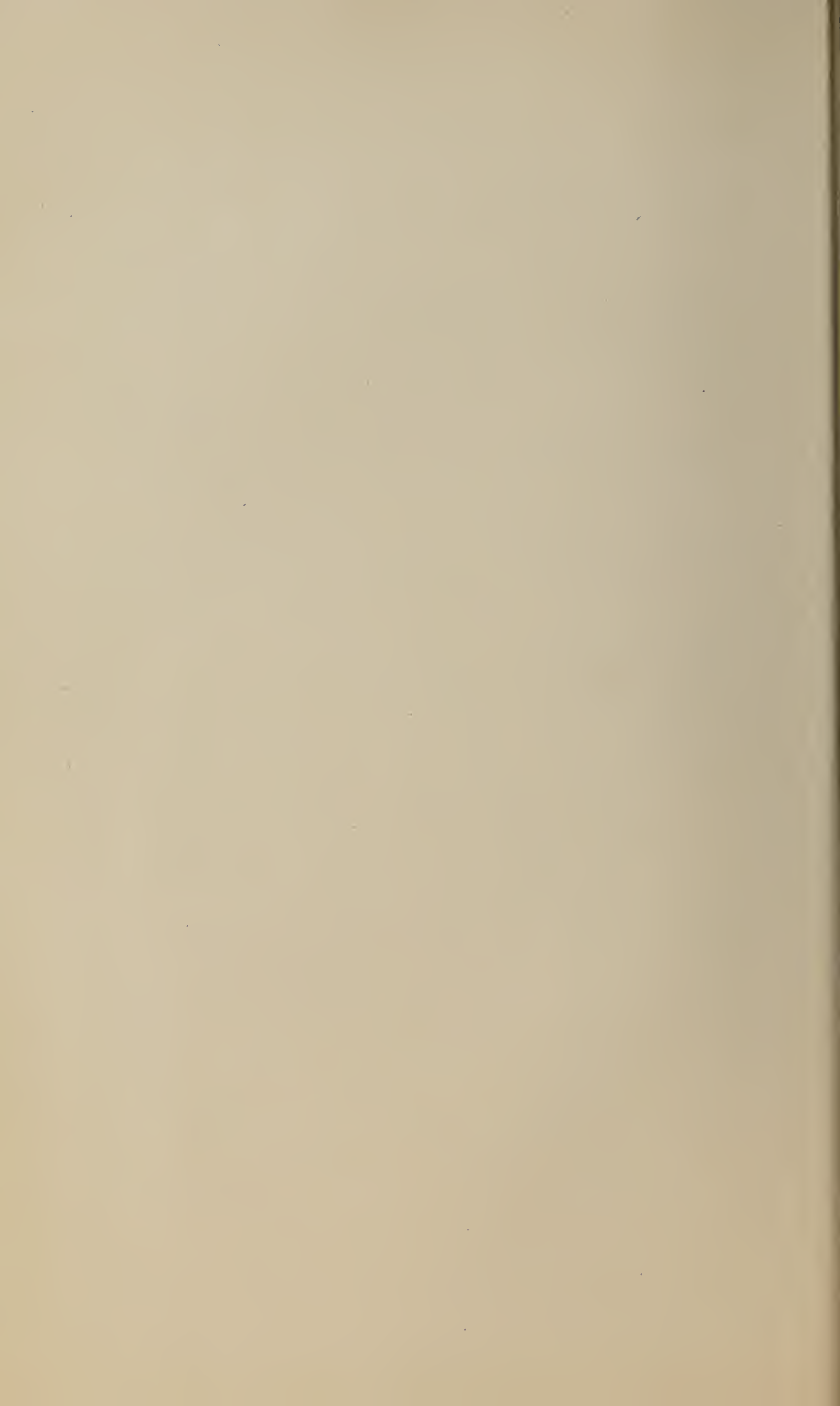
The expense of additional assistance in carrying on the work, and to some extent the expense of procuring material, was

¹ Read before the Botanical Society of America, St. Louis, December 30, 1903.

² See Bot. Gaz. 29:268-276; Jour. Mycol. 8:51-56; and Bot. Gaz. 35:10-23.



THE GENUS HARPOCHYTRIUM



borne this year in part by the Indiana Experiment Station and in part by a grant from the Botanical Society of America. By this means I was enabled to have the services of Mr. J. Clyde Marquis, an undergraduate student of the university, who made part of the preliminary drop cultures and attended to the microscopical technique, and of Mr. Fred J. Seaver, a graduate of Morningside College, Sioux City, Iowa, and a fellow in botany at the University of Iowa, who made most of the sowings and drop cultures and kept the records. The most active period for this work extends from the middle of April to the middle of June, while a smaller portion of the work extends through the remaining months of the year. The grant from the Botanical Society also permitted systematic field observations at Fair Oaks in the oak barrens of northern Indiana, where many species of rusts abound, for the most part unlike those occurring at Lafayette where the chief field observations heretofore necessarily have been made. These excursions into an unworked locality resulted in the discovery of the *Andropogon-Comandra* combination, the undescribed *Carex-Solidago* combination, and the autoecious character of the wide-spread *Lespedeza* rust, as well as minor items.

During the present season 68 collections of material were employed, and 217 drop cultures were made from them to test the germinating condition of the spores. Out of these 26 collections refused to germinate, and were consequently useless. There were in all 215 sowings of spores made, representing 32 species of rusts, and for this purpose were required 72 species of hosts temporarily grown in pots in the greenhouse. As in previous years success was attained in no case except when definite clues derived from field observations were in hand.

In order to provide ample resources, as far as possible, so that whatever suggestions are obtained even late in the season can be tested without delay, a stock of teleutosporic material is laid in of any species obtainable. In consequence there are always some species on hand in germinating condition with no definite guide for their use. So far as time permits these are sown upon any hosts known to bear aecidia in the region where the rust abounds. The results so far have been confined wholly to the negative information that the aecidia could not be produced on certain hosts. The following is a record of such blind attempts made during 1903. Teleutospores were employed in every case.

1. *UROMYCES ACUMINATUS* Arth. on *Spartina cynosuroides* Willd. from Fair Oaks, Ind., was sown on *Hydrophyllum appendiculatum*, with no infection.

2. *PUCCINIA POLYGONI-AMPHIBII* Pers. on *Polygonum emersum* (Michx.) Britt. from Columbus, Ohio, and Fair Oaks,

Ind., was sown on the same host and on *Cicuta maculata*, with no infection. Last year this rust was sown on two other species of *Polygonum* without infection. Recently the preliminary announcement of rust cultures for the season of 1903 by Dr. W. Tranzschel of St. Petersburg has been published. He states that infection was secured on *Geranium*, showing that the widely distributed *Aecidium sanguinolentum* Lindl., commonly found on *Geranium maculatum* in America, is the alternate form of this rust. My own observations in the field all go to affirm the correctness of this result.

3. PUCCINIA on *Carex Pennsylvanica* Lam. from Red Cloud, Neb., and Fair Oaks, Ind., was sown on *Aster paniculatus*, *A. Drummondii*, *A. prenanthoides*, *Solidago rigida*, *S. canadensis*, *Xanthium Canadense*, *Silphium perfoliatum*, *Ribes Cynosbati*, *R. aureum*, *Geranium maculatum*, *Viola cucullata*, and *Onagra biennis*, with no infection.

4. PUCCINIA on *Carex graviora* Bailey from Red Cloud, Neb., was sown on *Aster Drummondii*, *A. paniculatus*, *Senecio obovatus*, *Boltonia asteroides*, *Silphium perfoliatum*, *Ambrosia trifida*, *Xanthium Canadense*, *Cleome spinosa*, *Sambucus Canadensis*, *Ribes Cynosbati*, *Xanthoxylum Americanum*, and *Onagra biennis*, with no infection.

5. PUCCINIA on *Elymus Canadensis* L. from Red Cloud, Neb., was sown on *Impatiens aurea*, *Symphoricarpos racemosus*, and *Napaea dioica*, with no infection. There are various reasons, of which the above is one, for thinking that the rust on the several species of *Elymus*, occurring east of the Rocky Mts., which has heretofore been referred to one species really belongs to several species.

6. PUCCINIA VEXANS Farl. on *Bouteloua curtipendula* (Michx.) Torr. from Red Cloud, Neb., was sown on *Cleome spinosa*, *Physalis heterophylla*, *Physalodes Physalodes*, *Cassia Chamaecrista*, and *Pentstemon hirsutus*, with no infection.

7. PUCCINIA TOSTA Arth. on *Sporobolus neglectus* Nash from Red Cloud, Neb., was sown on *Oxalis cymosa*, *Ceanothus Americanus*, *Symphoricarpos racemosus*, *Cassia Chamaecrista*, *Callirrhoe involucrata*, *Xanthoxylum Americanum*, *Cleome spinosa*, and *Aster ericoides*, with no infection.

8. PUCCINIA EMACULATA Schw. on *Panicum capillare* L. from Fair Oaks, Ind., was sown on *Aster prenanthoides*, *A. Drummondii*, *Solidago rigida*, *Lactuca Canadensis*, *Eupatorium perfoliatum*, *Xanthium Canadense*, *Ambrosia trifida*, *Apocynum cannabinum*, *Polemonium reptans*, *Ribes Cynosbati*, *Onagra biennis*, *Anemone Pennsylvanica*, and *Geranium maculatum*, with no infection.

Five species of rusts were successfully grown, that had been studied with success before, and reported upon by the writer and in part by other investigators. Mention of them here serves to confirm previous work, and in two cases to give additional knowledge regarding hosts.

1. PUCCINIA IMPATIENTIS (Schw.) Arth.—Teleutosporic material of this species on *Elymus Virginicus* was obtained near Lafayette, Ind., and sown, May 13, on *Impatiens aurea*. On May 18, an abundance of spermogonia appeared, and on May 26, an equal abundance of aecidia began to show. This result confirms the work of last year.³ The locality from which the teleutosporic material was obtained for this season's work is several miles from the one yielding material last year.

2. PUCCINIA AMPHIGENA Diet.—Teleutosporic material was obtained by the writer on *Calamovilfa longifolia* from the type locality at Chicago, Ill. A sowing was made on a mature leaf of *Smilax hispida*, May 23. Spermogonia appeared sparingly on May 29, but were not followed by aecidia. Another sowing was made on a partly grown leaf of the same host species, May 24, from which a great abundance of spermogonia began to appear on May 28, followed by an equal abundance of aecidia, June 5. Some question has been raised regarding the correctness of last year's work,⁴ as the teleutosporic form is known from regions where it is thought that *Smilax* does not grow, but that the genuine *Puccinia amphigena* has its alternate form on *Smilax* can no longer be doubted.

3. PUCCINIA ANDROPOGONIS Schw.—Teleutosporic material on *Andropogon scoparius*, collected at Bloomington in southern Nebraska, was sent to Rev. J. M. Bates. It was sown on *Pentstemon hirsutus*, May 19, giving rise to abundant spermogonia on May 25, followed by aecidia on June 4. Previous cultures have been made by Mr. William Stuart and the writer,⁵ and by Prof. W. A. Kellerman.⁶ There can be no question that this is a wide-spread and common species in North America.

4. PUCCINIA ALBIPERIDIA Arth.—Teleutosporic material of this species on *Carex gracillima* was most opportunely sent from Racine, Wis., by Dr. J. J. Davis. Sowing was made April 21, on *Ribes Cynosbati*, from which abundant spermogonia appeared on April 30, followed by great numbers of aecidia on May 11. A sowing made at the same time on *R. floridum* gave no infection. Three days later a sowing made on *R. aureum* seemed to have made a slight growth, which, nevertheless, came to naught. A sowing on *R. Uva-crispa*, a cut branch being placed in a glass of

³ Bot. Gaz. 35:18. 1903.

⁴ Bot. Gaz. 35:20. 1903.

⁵ Bot. Gaz. 29:272. 1900.

⁶ Jour. Mycol. 9:10. 1903.

water in the laboratory in lieu of a potted plant, gave some spermogonia, but the leaf fell from the stem before the time for the appearance of the aecidia. It would have undoubtedly been a successful infection, had the conditions been favorable for maintaining the vigor of the host. This species is based upon cultures made by the writer⁷ in 1901. Its exact standing is yet in some uncertainty, and probably can not be settled until the connection of the very common aecidium, or aecidia if more than one kind, on the several species of *Ribes* is ascertained. Dr. J. J. Davis⁸ has expressed the opinion that the whiteness of the aecidial cups is probably due to the conditions under which they are grown, and that they are normally orange-colored and identical with the common form. But the facts can only be ascertained by cultural studies.

5. PUCCINIA HELIANTHI Schw.—Ample teleutosporic material was available in vigorous germinating condition, collected by Prof. W. A. Kellerman at Sandusky, Ohio, and by the writer at Fair Oaks, Ind. All of it was on *Helianthus mollis*. Sowings began on April 29, and continued at intervals until June 2, twenty cultures being attempted. The sowings on *H. strumosus*, *H. tuberosus*, *H. grosse-serratus*, *H. rigidus*, and *H. Maximiliani* gave no infection. The sowing on *H. tomentosus* gave a slight infection, a few spermogonia appearing but reaching no further development, although the leaves were young and the plants exceptionally vigorous. On *H. mollis* and *H. annuus* an exceedingly strong infection was produced, numberless spermogonia appearing, followed by well developed aecidia in great quantity. The first sowings on *H. mollis* were made May 6, the first spermogonia appearing May 16, and the first aecidia May 22 and 23. A second sowing was made May 29, giving spermogonia June 7, and aecidia June 16. The sowing on *H. annuus* was made June 2, showing spermogonia June 8, and aecidia June 17.

Cultures of the Helianthus-rust were made during the previous year's work,⁹ employing spores from *H. grosse-serratus*, which were found to grow upon the same host and the similar *H. Maximiliani*, but not upon *H. strumosus*. Judging from the work of the two years, it appears possible to divide the Helianthus-rust into at least three series, for which the forms on *H. mollis*, *H. strumosus* and *H. grosse-serratus* may be taken as representatives respectively. Dr. E. Jacky¹⁰ of Switzerland has made cultures, and has come to the conclusion that there are two species of Helianthus-rust, for which the names *P. Helianthi* Schw. and *P. helianthorum* Schw. are to be used. It seems to

⁷ Jour. Mycol. 8:53. 1902.

⁸ Trans. Wis. Acad. Sci. 14:88. 1903.

⁹ Bot. Gaz. 35:17. 1903.

¹⁰ Centr. f. Bakt. 9²:841. 1902.

me that the data are yet too meager to make it worth while to undertake to decide upon the nomenclature of the forms or species, which ever they may be called.

In addition to the foregoing results seven species of rusts were grown, establishing aecidial and teleutosporic connections, not heretofore recorded. The species are partly autoecious and partly heteroecious rusts.

I. MELAMPSORA MEDUSAE Thüm.—Teleutosporic material on *Populus deltoides* Marsh. was obtained in the vicinity of Lafayette, Ind., and although of inferior quality, for the poplar rust was not abundant in this region last year, it was sown on *Larix decidua* Mill. (*L. Europaea* DC.) April 28. After a rather long interval of 16 days I was surprised and gratified to observe the beginning of spermogonia (May 14) in good quantity; and five days later (May 19), the aecidia appeared, and proved to be a caeoma-form. A sowing on this host was tried last year¹¹ without infection, which is, however, easily accounted for by the fact that the host plants employed in 1902 were very feeble. For the supply of *Larix*, used this year I am indebted to the generosity of R. Douglas' Sons, proprietors of the Waukegan Nurseries at Waukegan, Ill. They sent without remuneration 25 very thrifty young larch, suitable for 6-inch pots, which made vigorous growth when brought into the greenhouse.

This species is the American representative of the European *M. populina* Lév., both species having their aecidia on *Larix*. That the American form is specifically distinct from the European was pointed out by Klebahn¹² in 1899, the differences being especially marked in the form, size and markings of the uredospores, and in the apical thickening of the teleutospores. The American form may be characterized as follows:

MELAMPSORA MEDUSAE Thuem.

O. Spermogonia epiphyllous, numerous scattered, inconspicuous, pale yellow, papilliform, by vertical sections shown to be columnar or hemispherical, raised above the surface, 40-55 μ , in diameter.

I. Aecidia hypophyllous, numerous, scattered, small, less than .5 mm. in diameter, pale yellow; peridium absent; aecidiospores catenulate, globoid, 20 μ in diameter; wall colorless, nearly 3 μ thick, finely verrucose.

II. Uredospores amphigenous, or sometimes only hypophyllous, roundish, small, less than .5 mm. in diameter, early naked, somewhat pulverulent, orange yellow; uredospores oval, or obovate-oblong, 15-18 by 22-30 μ usually flattened on opposite sides; wall colorless, 2.5-3 μ , thick, or up to 10 μ on the flattened sides, sparsely and evenly echinulate with fine papillae, except on the flattened sides which are smooth; paraphyses

¹¹ Bot. Gaz. 35:11. 1903.

¹² Ztschr. f. Pfl.-Kr. 9:144. 1899.

usually numerous, peripheral, capitate, smooth, 40-50 μ long, head 14-20 μ broad.

III. Teleutosori amphigenous, or sometimes only hypophyllous, small, irregularly roundish and scattered, or somewhat coalescing, subepidermal, at first light reddish brown, becoming deep chocolate-brown; teleutospores prismatic, 12-14 by 30-44 μ , wall smooth, cinnamon-brown, uniformly thin, not thickened at apex.

Spermogonia and aecidia on *Larix*, but not yet collected. Uredo and teleutospores on *Populus deltoides* Marsh. (*P. Medusae* Benth., *P. Canadensis* Moench., *P. monilifera* Ait., *P. angulata* Ait.), *P. grandidentata* Michx., *P. tremuloides* Michx., *P. balsamifera* L., *P. angustifolia* Jas., and *P. trichocarpa* Torr. & Gr. Common throughout the United States and Canada.

2. UROMYCES PHASEOLI (Pers.) Wint.—This is a very common rust on various species of *Phaseolus*, *Strophostyles* and *Vigna*. Nevertheless its aecidial form is rarely seen, and it has been suggested that the American form might be heteroecious. Material for the cultures was collected near Lafayette, on *Strophostyles helvola* (L.) Britt. (*Phaseolus diversifolius* Pers.). It was sown, May 1, on *Euphorbia commutata* Engelm., with no infection. On May 15, a sowing was made on *Strophostyles helvola*, which gave abundant spermogonia on May 26, and well developed aecidia began to appear on June 4. Five subsequent sowings were made, but owing to difficulty in keeping the host-plants in flourishing condition only two of these gave positive results, and even these were less abundant than in the first trial. The autoecious character of the American form, however, is well demonstrated. It should be said that the somewhat common aecidium on *Apios* and *Amphicarpa* holds a doubtful relation to the bean rust, and is better considered distinct until positive relationship is established.

3. UROMYCES LESPEDEZAE-PROCUMBENTIS (Schw.) Curt. — This is a wide spread, and often abundant rust, occurring on various species of *Lespedeza*. No aecidium has ever been found clearly associated with it. The small and inconspicuous *Aecidium leucospermum* B. & C., rarely collected, has been suggested as a possible alternate form, but not very confidently.

Excellent teleutosporic material was obtained by the writer at Fair Oaks, Ind., in March, on the upright stems of *Lespedeza capitata* Michx. It was not until late in May that a host-plant was well established in the greenhouse. A sowing of spores was made on May 28, the host being *L. capitata*. Infection resulted, but the development was slow, clearly due to inferior growth conditions. On June 14 the first spermogonia protruded, soon becoming exceedingly numerous, and on June 18, the minute, colorless aecidia began to appear in great numbers. The typical form of *Aecidium leucospermum* was the result.

4. PUCCINIA CAULICOLA Tr. & Gall.—Fine teleutosporic material of this species on the stems of *Salvia lanceolata* Willd. was

sent to me in March by Mr. Elam Bartholomew, from Rockport, Kans. Seeds of the host were also sent, from which young plants were grown for culture work. A sowing was made on April 27; on May 11, the spermogonia began to appear, and on May 18, the aecidia. One later sowing was also successful, but the host plants did not flourish, and the results were meager. The demonstration, however, proved ample to establish the autoecious character of the species.

The aecidium of this species is so rarely seen as to give rise to the conjecture that the species might not possess an aecidium. The species is usually listed under *Puccinia nigrescens* Pk. This specific name, however, belongs to the somewhat similar European species, as pointed out by Bubák, who unnecessarily bestowed the new name *P. Salviae-lanceolatae* upon the American form. The rust occurs commonly upon the leaves, but is so much more conspicuous upon the stems, especially after the leaves have partly or wholly fallen, that most collections show the caulicolous form only.

5. UROMYCES on *Carex*.—A species of *Uromyces* on *Carex* was found at Fair Oaks, Ind., on March 22 in very great abundance, and in fine viable condition. The *Carex* grew in an open sandy woodland, but in a depression of the surface where water sometimes gathered during heavy rains. It grew in tufts over a half acre of ground, and belonged to two species, *C. lanuginosa* Michx., easily told from the abundance of last year's fruiting culms still present, and *C. varia* Muhl., which showed not a trace of last year's culms, and was determined from the fruiting of a plant transferred to the greenhouse, and verified by a subsequent visit to the locality on May 3. On this latter visit a careful search for aecidia was made in the vicinity of the rusted *Carex*, but a few young leaves of a *Solidago* with spermogonia were the only result. These were growing with leaves intermixed and well surrounded by the rusted *Carex*. This was a very doubtful clue, as the common *Solidago* aecidium is known to belong to a *Puccinia*, yet experience has taught that the most improbable clues are not to be despised when the evidence is direct. Before finding this clue, sowings of the rust on *Carex varia* had been made on *Viola Cucullaria*, *Isopyrum biternatum*, *Trillium recurvatum*, *Ribes Cynosbati* and *R. aureum* with no infection. After the clue was obtained it was sown on five species of *Aster* with no infection, and on five species of *Solidago* with abundant infection. The following is the record of the latter. Sown May 6 on *S. Canadensis* L., showing abundant spermogonia on May 14, and aecidia on May 22. A sowing May 26 on *S. serotina* Ait. gave first spermogonia June 5, and aecidia June 16, the results being especially good. An equally successful culture was made on each of the two hosts at subsequent dates. Positive but less flourishing cultures were made on *S. flexicaulis*

L. and *S. caesia* L., clearly in accordance with the vigor of the host plants, while a sowing on *S. rigida* L. wholly failed, the host showing a weak growth.

The above sowings were all made from material on *Carex varia*. The collection on *C. lanuginosa*, taken at the same time and place, appearing in every way to be the same species, and to be in equally viable condition, was sown under equally favorable circumstances on *Silphium perfoliatum*, *Ribes Cynosbati*, five species of *Aster*, and on *Solidago rigida*, *S. serotina* and repeatedly on *S. Canadensis*, all with no infection.

Whether the failure to infect the *Solidago* was due to some undetected oversight in manipulation, or is an indication of specific or racial difference in the rust, is a matter for which the facts do not warrant an opinion.

It is not easy to determine if this rust has been previously described and named or not. Upon morphological grounds it is clearly distinct from *Uromyces caricina* E. & E. and *U. minutus* Diet., but it may be the same as *U. perigynius* Halst. It also agrees well with collections from Wisconsin¹³ on *Carex gracillima* Schw., from Decorah, Iowa,¹⁴ on *C. pubescens* Muhl., and from Greencastle, Ind.,¹⁵ on what was taken to be *C. pubescens*, but which a re-examination shows to be almost certainly *C. virescens* Muhl. If the rust on *C. varia* and *C. lanuginosa* had shown the same cultural behavior, I would have been inclined to unite these several collections under one name. But realizing the need of advancing cautiously among a group of species where only the first step has been taken, it seems wiser to give a separate name to the form about which we have definite knowledge, and leave the others to be dealt with later. The rust on *C. varia* with its alternate form is therefore, characterized under a new name, as follows:

UROMYCES SOLIDAGINI-CARICIS nom. nov.

O. Spermogonia epiphyllous, in small groups on yellow spots, punctiform, honey yellow, subepidermal, in vertical section shown to be globose, about 115 μ in diameter; isticular filaments free, 60 μ long:

I. Aecidia hypophyllous, in groups, often circinating, peridia pale, low cylindrical, margin revolute, lacerate; aecidiospores globoid, or slightly elongated, 13-16 by 14-18 μ ; wall colorless, thin, 1 μ or sometimes a little more, minutely rugose.

II. Uredosori not seen; uredospores among the teleutospores oval or obovate, about 16 by 23 μ ; wall thin, echinulate.

III. Teleutosori hypophyllous, round, oblong or sometimes elongated, pulvinate, early naked, firm, chestnut-brown; teleutospores obovate, 15-18 by 23-28 μ , rounded or obtuse above, narrowed below; wall smooth, thin, 1.5-2 μ , apex greatly thickened, 6-10 μ ; pedicel slender, tinted, as long as the spore, or longer.

¹³ Trans. Wis. Acad. Sci. 9:180. 1892. Same 14:90. 1903.

¹⁴ Bot. Gaz. 16:226. 1891.

¹⁵ Same, 1. c.

The collection on *Carex varia* Muhl., made at Fair Oaks, Ind., March 22, 1903, is taken as the type, together with the result of the culture on *Solidago Canadensis* L. obtained by a sowing made June 3, and matured July 1, 1903, at which date it was placed in the herbarium. I would tentatively refer here the collections referred to above on *C. gracillima*, *C. pubescens*, *C. virescens* (?) and *C. lanuginosa*, leaving their exact status to be determined later.

The aecidium of this species does not appear to differ in any marked manner from that of *Puccinia Caricis-Solidaginis* Arth., although, perhaps, the spores are a trifle smaller. I have not, however, had opportunity of collecting it in the field, as the heavy spring rains flooded the type locality and prevented all subsequent development of the rust, so that in subsequent visits at different times during the season the most diligent search failed to reveal any trace of it on either *Solidago* or *Carex*.

6. AECIDIUM PUSTULATUM Curt.—In early April, 1902, an observation was made at Spirit Lake, Iowa, that proved very puzzling for a time. On an open prairie, that had been burned over during the late fall, a small area showed *Comandra pallida* A. DC. with aecidia, and in contact with it *Andropogon scoparius* Michx. bearing uredo, of the characteristic thin-walled sort known to belong to the species with aecidium on *Pentstemon*. It was easy to find teleutospores on the grass leaves pressed into hollows, thus protected from the passing fire, and only in part germinated. These were collected and sown on *Pentstemon hirsutus* with no infection. A sowing was not made on *Comandra*, as no suitable growing plants were available. A similar observation was made again this year at Fair Oaks, Ind., and once more under circumstances that seemed to permit of no other inference but that the *Comandra* and *Andropogon* rusts were connected, highly improbable as it seemed. This time plants of *Comandra umbellata* (L.) Nutt. were secured. A sowing of teleutospores from *Andropogon furcatus* Muhl. was made on May 5, and spermogonia began to appear on May 16, but the host plant withered before time for aecidia to appear. A similar sowing was made on a more vigorous host, May 25, spermogonia appearing in great abundance May 30, and aecidia June 9. Another sowing of teleutospores from *A. scoparius* obtained in the same locality at Fair Oaks, was made on *Comandra umbellata* June 1, the first spermogonia appearing June 9, and aecidia June 19. Sowings of both sets of teleutospores were made twice on *Pentstemon hirsutus*, under the most favorable circumstances, with no infection. The conclusion is beyond all question, that a common rust on species of *Andropogon*, not readily distinguishable from *Puccinia Andropogonis* Schw., has its aecidia on *Comandra*, being identical with *Ae. pustulatum* Curt.

A rather careful study of the newly detected species appears to show that it is to be distinguished from *P. Andropogonis* Schw. by the very dissimilar aecidium, and by the pores of the uredospores, which number 5 to 8 and are distributed without order, while in *P. Andropogonis* they usually number 3, and are approximately equatorial. The name for the species should be *PUCCINIA PUSTULATA* (Curt.) nom. nov.

7. *AECIDIUM RANUNCULI* Schw. An exceedingly fortunate observation was made in May, within a few miles of Lafayette, Ind. On a somewhat shaded hillside, an area not exceeding ten feet long by three feet wide, attracted attention by the yellowness of the new vegetation. Looking closer, it was found that the growing mass was made up almost wholly of *Ranunculus abortivus* L. thickly covered with the *Aecidium Ranunculi* Schw., and an equal quantity of *Eatonia Pennsylvanica* (DC.) A. Gray, intermixed, not yet in flower, but every leaf covered with a light yellow uredo. No other rusts occurred for some distance around, and even none on the same hosts elsewhere in the locality.

Healthy plants of *Eatonia Pennsylvanica* were obtained from another locality, transferred to the greenhouse, and spores of *Aecidium Ranunculi* sown on the youngest leaves, May 13. From this sowing uredospores appeared on May 21, and characteristic teleutospores began to show June 3. Although the trial with teleutospores could not be made, yet the demonstration of the genetic relation of the two forms seems beyond question. A confirmatory observation upon the intimate association of the two forms in the field has been reported to me by Mr. E. W. D. Holway, from Decorah, Iowa.

This is one of the numerous grass rusts passing under the name of *Puccinia rubigo-vera*. It can not be called *P. Ranunculi*, as that name is preoccupied, and therefore, I propose the name

PUCCINIA EATONIAE nom. nov. (*Aecidium Ranunculi* Schw.)

O. Spermogonia hypophyllous, thickly scattered over large areas, preceding or among the aecidia, punctiform, honey-yellow, inconspicuous, subepidermal.

I. Aecidia hypophyllous, evenly scattered over large areas; peridia broad and short, recurved, finely lacerate; aecidiospores subglobose or elliptical, 15-22 by 18-25 μ ; wall colorless, medium thick, 1.5-2 μ , minutely verrucose; mycelium perennial in the host.

II. Uredosori chiefly epiphyllous, on yellow spots, small, oblong, pale yellow, ruptured epidermis noticeable; uredospores obovate-globoid, 15-18 by 20-23 μ ; wall thin when mature, about 1 μ , pale yellow, finely and evenly echinulate, pores 6-8, scattered.

III. Teleutosori chiefly hypophyllous and caulicolous, small, oblong to linear, covered by the epidermis; teleutospores oblong-clavate to linear-cuneate, 12-16 by 35-45 μ , truncate or rounded above, narrowed below, slightly or not constricted at the septum; wall smooth, light brown, thin, 1-1.5 μ , apex a little darker and thicker, 3-4 μ ; pedicel very short, colored; paraphyses none, or few.

8. *AECIDIUM HYDNOIDEUM* B. & C.—Coming upon some bushes of *Dirca palustris* L., the middle of June, that were conspicuous with great numbers of yellow aecidial spots, search was made for grass and sedge rusts in the vicinity. At one side, by a small ravine, was found a most luxurient growth of uredo upon *Bromus ciliatus* L., with last year's teleutospores on the dead radical leaves. The most distant bush of rusted *Dirca* was not over a hundred feet away.

As soon as suitable potted plants of *Bromus ciliatus* could be established in the greenhouse, aecidiospores from the *Dirca* were sown. The first sowing came to naught, as the host plant failed to grow well. A sowing on June 25 gave uredospores in abundance on July 4. Teleutospores were first observed on August 10, although they probably appeared somewhat earlier.

The success of this trial removes another rust from that limbo of grass forms passing under the name of *Puccinia rubigovera*. We may characterize the species as follows, under the name

PUCCINIA HYDNOIDEA (B. & C.) nom. nov. (*Aecidium hydnoideum* B. & C.)

O. Spermogonia amphigenous in small groups on large yellow spots, inconspicuous, punctiform.

I. Aecidia hypophyllous, usually circinating about the spermogonia; peridia short, cylindrical, pale, margin slightly recurved, finely erose or torn; aecidiospores globoid or oblong-globoid, 11-15 by 14-19 μ ; wall yellowish, thin, 1 μ , minutely and inconspicuously verrucose.

II. Uredosori chiefly epiphyllous, oblong, early naked, pulverulent, fuscous; uredospores globoid or obovate-globoid, 18-21 by 20-28 μ ; wall brownish, thin, 1 μ , abundantly echinulate, pores 4 or more, scattered.

III. Teleutosori chiefly hypophyllous and caulicolous, small and numerous, oblong, covered by the epidermis; teleutospores linear-oblong, 13-18 by 30-50 μ , truncate or oblique above, obtuse or slightly narrowed below, not constricted at the septum; wall smooth, light brown, thin, 1-1.5 μ , thickened at apex, 4-7 μ ; pedicel very short, colored; paraphyses none, or few.

This species, undoubtedly, does not embrace all the American rusts on *Bromus*. It is, doubtless, the common form east of the Rocky Mts. Probably the multicellular form, found in Wisconsin and Minnesota, *Puccinia tomipara* Trel., is distinct, although it has not yet been shown that such irregular multiplication of cells in the teleutospore is a permanent character.

SUMMARY.

The following is a complete list of successful cultures made during the season of 1903. It is divided into the two series: species previously reported by the writer or other investigators, and species now reported for the first time.

A. Species previously reported.

1. *Puccinia Impatientis* (Schw.) Arth. — Teleutospores from *Elymus Virginicus* L. sown on *Impatiens aurea* Muhl.
2. *Puccinia amphigena* Diet. — Teleutospores from *Calamovilfa longifolia* (Hook.) Hack. sown on *Smilax hispida* Muhl.
3. *Puccinia Andropogonis* Schw. — Teleutospores from *Andropogon scoparius* Michx. sown on *Pentstemon hirsutus* (L.) Willd.
4. *Puccinia albiperidia* Arth. — Teleutospores from *Carex gracillima* Schw. sown on *Ribes Cynosbati* L. and *R. Uva-crispi* L. (*R. Grossularia* L.)
5. *Puccinia Helianthi* Schw. — Teleutospores from *Helianthus mollis* Lam. sown on *H. mollis* Lam. and *H. annuus* L.

B. Species reported now for the first time.

1. *Melampsora Medusae* Thuem. — Teleutospores from *Populus deltoides* Marsh. sown on *Larix decidua* Mill.
2. *Uromyces Phaseoli* (Pers.) Wint. — Teleutospores from *Strophostyles helvola* (L.) Britt. sown on same host.
3. *Uromyces Lespedezae-procumbentis* (Schw.) Curt. — Teleutospores from *Lespedeza capitata* Michx. sown on same host.
4. *Puccinia caulicola* Tr. & Gall. — Teleutospores from *Salvia lanceolata* Willd. sown on the same host.*
5. *Uromyces Solidagini-Caricis* Arth. — Teleutospores from *Carex varia* Muhl. sown on *Solidago Canadensis* L., *S. serotina* Ait., *S. flexicaulis* L. and *S. caesia* L.
6. *Puccinia pustulata* (Curt.) Arth. — Teleutospores from *Andropogon furcatus* Muhl. and *A. scoparius* Michx. sown on *Comandra umbellata* (L.) Nutt.
7. *Puccinia Eatoniae* Arth. — Aecidiospores from *Ranunculus abortivus* L. sown on *Eatonia Pennsylvanica* (DC.) A. Gray.
8. *Puccinia hydnoidea* (B. & C.) Arth. — Aecidiospores from *Dirca palustris* L. sown on *Bromus ciliatus* L.

Judging from the few instances that have come to my notice, the interest and importance of making observations upon proximity of aecidial and teleutosporic forms are not yet fully appreciated by American collectors of *Uredineae*. This is the most valuable method by which a reasonable conjecture can be made regarding the alternate connection of any one of the many scores of isolated aecidial forms, most of which are probably heteroeci-

* Successful cultures reported by Kellerman, Jour. Mycol. 9:27, Dec. 1903.

ous. Cultural work without such conjectures based on field observations are largely a waste of time, rarely leading to any positive information. The time to make observations is early spring, when the rusts first begin to show, mostly in April and May. Simple record of proximity is not especially important. The observations must show that the inference is well established, that the new growth of spores has come from germinating spores of another sort found near by. The ability to work out such an inference marks the logical and acute observer.

I desire to thank Messrs. Kellerman, Bates, Davis and Bartholomew for providing teleutosporic material, and also Mr. Holway for numerous favors. I have already mentioned the kindness of Messrs. R. Douglas' Sons in providing host plants; strong plants of *Callirrhoe involucrata* were sent by Mr. Bartholomew. My particular thanks, moreover, are due to the Botanical Society of America for providing funds by which the work could be prosecuted, not only in the laboratory but in the field. The observations at Fair Oaks, Ind., by far the most important of those made in a single locality, were rendered possible by the society's generosity.

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NOTES FROM MYCOLOGICAL LITERATURE. VIII.

W. A. KELLERMAN.

THE MYCOLOGICAL ARTICLES IN *ANNALES MYCOLOGICI*, VOL. I, No. 6, Nov. 1903, are as follows: The Genus *Harpochytrium* in the United States (Atkinson); Das Absterben der Stöcke der Johannis- und Stachelbeeren, verursacht von *Cytosporina Ribis* P. Magnus n. sp. (van Hall); Ueber die geographische Verbreitung der *Meliola nidulans* (Schw.) Cooke (Neger); Die Discomyceten-Gattung *Aleurina* Sacc. (Rehm); *Urophlyctis hemisphaerica* (Speg.) Syd. (Sydow); *Mycotheca germanica* Fasc. I (no. 1-50) Fasc. II (no. 51-100) (Sydow); Mycologische Fragmente (v. Höhnelt); Eine Neue *Puccinia* auf *Senecio* (Dietel); Sur le *Phytophthora infestans* (Matruchot & Molliard).

THE DAILY PROGRAM OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, 53d Annual Meeting at St. Louis, last week in 1903, contained the following mycological papers: Cultures of Uredineae in 1903, J. C. Arthur; Uredineous Infections in 1903, W. A. Kellerman; Some Unusual Diseases of Plants in Iowa for the Season of 1903, L. H. Pammel; Symbiosis in *Lolium*, E. M. Freeman; A Lichen Society of a Sandstone Riprap, Bruce Fink; The Genus *Harpochytrium*; its Development, Synonymy and Distribution, G. F. Atkinson;

The Phylogeny of Lichens, F. E. Clements; The Necessity of Reform in the Nomenclature of Fungi, F. S. Earle; The Taxonomic Value of the Spermogonium, J. C. Arthur; Proof of the Identity of *Phoma* and *Phyllosticta* on the Sugar Beet, G. G. Hedgcock; Unpublished Notes on the Uredineae, M. A. Carleton; *Craterellus taxophilus*, a New Species of Thelephoraceae, C. Thom; Fungi Cultivated by Texas Ants, A. M. Ferguson.

DR. RUD. ADERHOLD IS THE AUTHOR OF TWO ILLUSTRATED LEAFLETS, namely, *Der Krebs der Obstbäume und seine Behandlung* [Nectria], and *Die Monilia-Krankheiten unserer Obstbäume und ihre Bekämpfung*, which are publications of the Kaiserliches Gesundheitsamt, Berlin, Germany, Biologische Abtheilung für Land- und Forstwirtschaft, Flugblatt Nr. 14, Oct. 1902, and Flugblatt Nr. 17, Dec. 1902.

UREDINEAE JAPONICAE, IV, BY P. DIETEL IN ENGLER'S BOTANISCHE JAHRBUECHER, 32:624-632, gives a large number of new species, a few of the interesting ones being: *Puccinia asparagi lucidi* on *Asparagus lucidus*, *Phragmidium heterosporum* on *Rubus trifidus*, *Uredinopsis corchoropsidis* on *Corchoropsis crenata*: *Aecidium polygoni-cuspidati* on *Polygonum cuspidatum*, *Aecidium hydrangeae paniculatae* on *Hydrangea paniculata* and *Aecidium fraxini-bungeanae* on *Fraxinus bungeana*. *Uredinopsis corchoropsidis* occurs on a *Tiliaceous* host—heretofore representatives of this genus have been found only on Ferns.

TITLES OF MYCOLOGICAL ARTICLES IN OESTERREICH. BOT. ZEITSCHRIFT for the years 1901 and 1902 are as follows. H. & P. Sydow — *Zur Pilzflora Tirols*; H. & P. Sydow — *Uebersicht und Beschreibung sämtlicher bisher auf der Gattung Crepis gefundenen Uredineen*; Victor Kindermann—*Ueber das sogenannte Blüten der Frucht Körper von Stereum sanguinolentum Fr.*; P. Magnus — *Ein Beitrag zur Geschichte der Unterscheidung des Kronenrostes der Gräser in mehrere Arten.*

THE GENUS HARPOCHYTRIUM IN THE UNITED STATES is the subject of an extended article by Geo. F. Atkinson in *Annales Mycologici*, 1:479-502, Pl. X, Nov. 1903. He studied a form in 1895, and again the past season, occurring on *Spirogyra*, and proposes the name of *Harpochytrium intermedium* n. sp. He regards the generic names *Fulminaria* (by Gobi, 1889) and *Rhabdium* (by Dangeard, 1903), as synonyms with *Harpochytrium* (by Lagerheim, 1890). The known species are *H. hyalothecae* Lag. (*H. hyalothecae* Schroet., *Fulminaria mucophila* Gobi, *Fulminaria mucophila* Wille), *H. hedenii* (*Rhabdium acutum* Dang., *Fulminaria hedenii* Wille) and *H. intermedium* Atks.

C. J. J. VAN HALL OUTLINES HIS OBSERVATIONS AND PARTIAL STUDY of a prevalent and destructive disease of Currants and Gooseberries in North Holland, where these are extensively cultivated with great care and success and "therefore" remarkably

free from parasitic diseases. The root parasite is supposed by P. Magnus to be a new species. The article is published in *Annales Mycologici*, 1:503-512, Pl. XI, Nov. 1903, under the title: *Das Absterben der Stöcke der Johannis- und Stachelbeeren, verursacht von Cytosporina Ribis* P. Magnus (n. sp.)

ELLIS & EVERHART'S FUNGI COLUMBIANA, CENTURY XIX, edited and published by Elam Bartholomew, Stockton, Kansas, was issued Dec. 29, 1903. Three new species, with descriptions, appear in this century as follows: 1808, *Ascochyta lethalis* Ell. & Barth, n. sp., on living stems of *Melilotus alba*; 1820, *Dicoccum psoraleae* Ell. & Barth, n. sp., on living leaves and stems of *Psoralea tenuiflora*; 1874, *Septoria grindeliae* Ell. & Barth, n. sp., on living leaves of *Grindelia squarrosa*.

A REPORT IN SCIENCE, DEC. 25, 1903, OF GRANTS made by the Carnegie Institution for research during the fiscal year 1902-3, shows one Mycological subject, namely, *Researches on the Cytological relations of the Amoebae, Acrasieae and Myxomycetes*, E. W. Olive. The work was carried on in Professor Strasburger's laboratory in the Botanical Institute at Bonn, Germany. The sum granted for Mr. Olive's use was \$1,000. Two papers are nearly completed incorporating a portion of his results.

THE STRUCTURE AND CLASSIFICATION OF THE PHYCOMYCETES, with a revision of the Families and a rearrangement of the North American Genera, by Charles E. Bessey, is published in the *Trans. Am. Micr. Soc.* 24:27-54, Pl. II, Nov. 1903. The nine families of fungi are distributed among three orders, all of the class *Chlorophyceae*, of the branch *Phycophyta*. The author states that their affinities with their algal relatives, rather than their mutual relationships, must dominate their classification. To the groups, including genera, are added full and useful diagnoses preceded by extended synoptical keys.

A KEY TO THE NORTH AMERICAN SPECIES OF INOCYBE (second part) is given by F. S. Earle in *Torreyia*, 3:183-4, Dec. 1903. Twenty-five species are included, forming *sections* *Rimosae*, *Velutineae*, and *Viscidae*.

UEBER DIE IN GEBAEUDEN AUFTRETENDEN WICHTIGSTEN HOLZBEWOHNENDEN SCHWAMME von P. Hennings (*Hedwigia*, 42:178-191, 7 Oct. 1903) includes a very full general account of such fungi as *Merulius lachrymans*, *Polyporus vaporarius*, *Lenzites sepiaria* (*L. abietina*), *Dædalea quercina*, *Fomes igniarius*, *Coniophora cerebella*, *Corticium giganteum*, *Lentinus squamosus*, *Coprinus domesticus*, *Armillaria mellea*, *Xylaria polymorpha*, etc. The author states that he has found kürzlich in einem Hause bei Berlin auf der Unterseite feuchter, morscher kieferner Dielenbretter unter der Wasserleitung einen sehr kleinen schwarzen Pilz, namely, *Coniothyrium domesticum* P. Henn. n. sp. peritheciis superficialibus subglobosis vel ovoideis, sub-

papillatis, atris, membranaceo-subcarbonaceis, ca. 100-120 μ diam.; conidiis ovoideis ellipsoideis vel subcitriformibus, utrinque obtusiusculis, 1-2-guttulatis, læte brunneis, 8-10 x 4-5 μ .

IN BEIBLATT ZUR HEDWIGIA, 42:(233)-(240), 7 Oct. 1903, P. Hennings publishes some interesting notes Ueber die an Bäumen wachsenden heimischen Agariceen. Some interesting statements are: that *Collybia velutipes* occurs on various species of *living trees* (commoner however on stumps); *Pleurotus ostreatus* common on *living* trunks, seldom on stumps; *Pleurotus ulmarius* especially on *living* Elm trunks, in Schlesien on *Tilia*; *Pluteus cervinus* mostly on stumps of deciduous trees and evergreens, but also quite often on *living* trunks; *Lentinus stypticus* on stumps and on *living* Hazel; *Schizophyllum alneum* on prostrate Ash-stems, etc., also on *living* Linden, commoner in the tropics on various *living* tree trunks.

IN PROFESSOR BESSEY'S ARTICLE ON EVOLUTION IN MICROSCOPIC PLANTS, Trans. Am. Micr. Soc. 24:5-12, Nov. 1903, we notice that the "chlorophylless members of the class of the green-algae (Chlorophyceae)", the more important families being Saprolegniaceae and Peronosporaceae, show but little modification from that of a *green felt*, the former having lost the chlorophyll, become reduced in size, and bear many zoospores; but the downey-mildews have become parasitic on higher (aerial) plants, and substituted conidia for zoospores and suppressed antherozoids. The Mucoraceae are "related to the green felts" — and in the sexual apparatus the greatest modifications have taken place.

IN MYCOLOGISCHE FRAGMENTE, ANN. MYCOLOG. 1:522-534, Nov. 1903, Dr. Franz v. Höhnelt describes many new species and the following new genera: *Bresadolella* n. gen. *Nectriacearum*; *Myxolibertella* n. gen. — est *Libertella* vel *Myxosporium* cum sporulis filiformibus et oblongis (vel fusoides) commixtis; *Sporodiniopsis* n. gen. *Hyphomycetum*; *Cirrhomycetes* n. gen. *Dematiacearum*; *Aegeritopsis* n. gen. — *Tuberculariaceae* mucedineae staurosporae. In the same article he states that *Cercospora platyspora* E. et Holw. on *Zizia integerrima*, and *Cercospora sii* E. et Ev. on *Sium cicutifolium*, are the same and höchst wahrscheinlich synonyms of *Fusicladium depressum* — not *Cercospora* because the spores are two-celled.

CORTICIUM VAGUM B. & C. VAR. *SOLANTI* BURT, a fruiting stage of *Rhizoctonia solani*, is reported by F. M. Rolfs in Science, N. S. 18:729, Dec. 4, 1903. This is based on a study of the Potato *Rhizoctonia* begun in 1901. "Observations show that potato plants developed from tubers which are more or less covered with sclerotia of this fungus usually have their subterranean parts overrun with a dark brown cobweb-like mycelium. This frequently extends up the green stems from one to three inches above the ground forming a thin hymenial layer which is usu-

ally gray-white in color. . . . The tips of the outermost branches of this hymenial layer become changed into basidia bearing from two to six sterigmata."

EINE NEUE PUCCINIA AUF SENECIO VON P. DIETEL, (Ann. Mycolog. 1:535, Nov. 1903) is *Puccinia tasmanica* Diet. n. sp., Tasmania, in caulibus foliisque Senecionis vulgaris, IV, 1895. Aecidia and teleutospores are noted; adsunt etiam teleutosporeae uniloculares.

SYDOW, MYCOTHECA GERMANICA FASC. I (NO. 1-50), FASC. II (NO. 51-100), the first two fascicles of a new set of Exsiccata, are noticed in Ann. Mycolog. 1:519 and 536, Nov. 1903. Diagnoses of the new species included (five in the first and six in the second Fascicle) are a part of the article here alluded to.

H. U. P. SYDOW GIVE A NOTE IN ANNALES MYCOLOGICI, 1: 517-8, Nov. 1903, touching "*Urophlyctis hemisphaerica* (Speg.) Syd." which Spegazzini described in Fungi Argent. IV, 1881, as *Uromyces hemisphaericus*. The authors list the synonymy of *Urophlyctis hemisphaerica* (Speg.) Syd. as follows: *Uromyces hemisphaericus* Speg. (1881), *Urophlyctis kriegeana* P. Mag. (1888), *Protomyces vagabundus* Speg. pp. (1891), *Cladochytrium kriegeana* A. Fisch. (1892), *Entyloma hemisphaericum* Speg. pp. (1889), *Oedomyces hemisphaericus* Speg. pp. (1903).

NUMEROUS MYCOLOGICAL ARTICLES HAVE APPEARED IN COMPTES RENDUS, T. 136, Jan.-June, 1903, par exemple: Beauverie, La Maladie des platanes; Coupin, Sur la nutrition du *Sterigmatocystis nigra*, Sur les formes tératologiques du *Sterigmatocystis nigra* privé de potassium; Dangeard, Observations sur la théorie du cloisonnement, Observations sur le *Monas vulgaris*, Un nouveau genre de Chytridiacées: le *Rhabdium acutum*, Sur le nouveau genre *Protascus*, La sexualité dans le genre *Monascus*, Sur le *Pyronema confluens*; Guilliermond, Contribution à l'étude de l'épithème des Ascomycètes, Nouvelles recherches sur l'épithème des Ascomycètes; Mangin, Sur la phthiariose, maladie de la Vigne causée par le *Dactylopius Vitis* et le *Bornetina Corium*, Sur la maladie du Châtaignier causée par le *Mycelophagus Castaneae*, Sur un nouveau groupe le Champignons, les Bornétinées, et sur le *Bornetina corium* de la Phthiariose de la Vigne; Marchal, La spécialisation du parasitisme chez l'Erysiphe graminis D.C.; Matruchot, Germination des spores de truffes; culture et caractères du mycélium truffier, Sur les caractères botaniques du mycélium truffier; Molliard, Rôle des bactéries dans la production des périthèces des *Ascobolus*; Prunet, Sur un maladie des rameaux du Figuier; Ray, Étude biologique sur le parasitisme: *Ustilago Maydis*.

INDEX TO UREDINEOUS CULTURE EXPERIMENTS
WITH LIST OF SPECIES AND HOSTS FOR
NORTH AMERICA. I.

W. A. KELLERMAN.

(Continued from p. 257, Vol. 9.)

Since the first part of this INDEX was published there has appeared (on the preceding pages of this No. of the Journal), an important article embodying the culture work of J. C. Arthur in 1903. The following additions thereto, including some corrections, are to be referred to their proper alphabetical place in that portion of the Index.

AECIDIUM ellisii Tr. & Gall. on *Chenopodium album* L., *see* *Puccinia subnitens* Diet. from *Distichlis spicata* (L.) Greene. [Kellerman.]

AECIDIUM on *Helianthus grosse-serratus* Mont. on *H. maximiliani* Schrad., *see* *Puccinia helianthi* Schw. from *Helianthus grosse-serratus* Mart. [Arthur.]

AECIDIUM on *Helianthus annuus* and *H. mollis*, *see* *Puccinia helianthi* Schw. from *Helianthus mollis*. [Kellerman]

AECIDIUM *hydnoideum* B. & C., from *Dirca palustris* L. (uredo and teleuto [*Puccinia hydnoidea* (B. & C.) Arth. n. n.] on *Bromus ciliatus* L.). J. C. Arthur. Jour. Mycol. 10:19. Jan. 1904.

AECIDIUM [Caeoma] on *Larix decidua* Mill., *see* *Melampsora medusae* Thüm. teleutospores from *Larix decidua*. [Arthur]

AECIDIUM *leucospermum* B. & C. on *Lespedeza capitata* Mx., *see* *Uromyces lespedezae-procumbentis* (Schw.) Curt. teleutospores from *Lespedeza capitata*. [Arthur]

AECIDIUM *pustulatum* Curt. on *Comandra umbellata* (L.) Nutt., *see* *Puccinia pustulata* (Curt.) Arth. teleutospores from *Andropogon furcatus* Muhl. and *A. scoparius* Mx. [Arthur]

AECIDIUM *ranunculi* Schw. from *ranunculus abortivus* L. (uredo and teleuto [*Puccinia eatoniae* Arth. n. n.] on *Eatonia pennsylvanica* (DC.) A. Gray). J. C. Arthur. Jour. Mycol. 10:18. Jan. 1904.

AECIDIUM on *Ribes cynosbati* (spermogonia and aecidia), *see* *Puccinia albiperidia* Arth. teleutospores from *Carex gracillima* Schw. [Arthur]

AECIDIUM on *Salvia lanceolata*, *see* *Puccinia caulicola* Tr. & Gall. teleutospores from *Salvia lanceolata*. [Arthur]

- AECIDIUM on *Solidago canadensis* L., *S. serotina* Ait., *S. flexicaulis* L., *S. caesia* L., *see* *Uromyces caricis-solidaginis* Arth. teleutospores from *Carex varia* Muhl. [Arthur]
- ANDROPOGON *furcatus* Muhl. and *A. scoparius* Mx. (spermogonia and aecidia [*Aecidium pustulatum* Curt.] on *Comandra umbellata* (L.) Nutt., *see* *Puccinia pustulata* (Curt.) Arth. from *Andropogon furcatus* Muhl. and *A. scoparius* Mx. [Arthur]
- ANDROPOGON *scoparius* Mx. and *A. furcatus* Muhl., *see* *Andropogon furcatus* Muhl. and. . . [Arthur]
- ANDROPOGON *scoparius* Mx. (spermogonia and aecidia on *Pentstemon hirsutus*), *see* *Puccinia andropogonis* Schw. teleutospores from *Andropogon scoparius* Mx. [Arthur]
- BROMUS *ciliatus* L. (*Puccinnia hydnoidea* (B. & C.) Arth), *see* *Aecidium hydnoideum* B. & C. from *Dirca palustris* L. [Arthur]
- CAEOMA on *Larix decidua* Mill., *see* *Aecidium* on *Larix decidua* Mill. [Arthur]
- CALAMOVILFA *longifolia* (Hook.) Hack. (spermogonia and aecidia on *Smilax hispida*), *see* *Puccinia amphigena* Diet. teleutospores from *Calamovilfa longifolia* (Hook.) Hack. [Arthur]
- CAREX *gracillima* Schw. (spermogonia and aecidia on *Ribes cynosbati*), *see* *Puccinia albiperidia* Arth. teleutospores from *Carex gracillima* Schw. [Arthur]
- COMANDRA *umbellata* (L.) Nutt. (*Aecidium pustulatum* Curt.), *see* *Puccinia pustulata* (Curt.) Arth. teleutospores from *Andropogon furcatus* Muhl. and *A. scoparius* Mx. [Arthur]
- CAREX *varia* Muhl. (spermogonia and aecidia on *Solidago canadensis* L., *S. serotina* Ait., *S. flexicaulis* L., *S. caesia* L.) *see* *Uromyces caricis-solidaginis* Arth, teleutospores from *Carex varia* Muhl. [Arthur]
- CHENOPODIUM *album* L. (*Aecidium ellisii* Tr. & Gall.), *see* *Puccinia subnitens* Diet. from *Distichlis spicata* (L.) Greene. [Kellerman]
- DIRCA *palustris* L. (uredo and teleuto [*Puccinia hydnoidea* (B. & C.) Arth. on *Bromus ciliatus* L., *see* *Aecidium hydnoideum* B. & C. from *Dirca palustris* L. [Arthur]
- DISTICHLIS *spicata* (L.) Greene (*Aecidium ellisii* Tr. & Gall. on *Chenopodium album* L.), *see* *Puccinia subnitens* Diet. from *Distichlis spicata* (L.) Greene. [Kellerman]
- EATONIA *pennsylvanica* (DC.) A. Gray (*Puccinia eatoniae* Arth.), *see* *Aecidium ranunculi* Schw. from *Ranunculus abortivus* L. [Arthur]

ELYMUS virginicus L. (spermogonia and aecidia on Impatiens aurea), *see* Puccinia impatientis (Schw.) Arth. teleutospores from Elymus virginicus. [Arthur]

The preceding entries belong alphabetically with the first installment — printed on pp. 247-257, Vol. 9.

EUPHORBIA nutans (Uromyces euphorbiae C. & P. uredo and teleuto), *see* Uromyces euphorbiae C. & P. aecidiospores (Aecidium euphorbiae Am. Auct.) from Euphorbia nutans. [Arthur]

EUPHORBIA nutans Lag. (Uromyces euphorbiae C. & P. uredo on Euphorbia nutans Lag.), *see* Uromyces euphorbiae C. & P. aecidiospores from Euphorbia nutans Lag. [Arthur]

EUPHORBIA nutans (Uredo on Euphorbia nutans), *see* Uromyces euphorbiae C. & P. aecidiospores from Euphorbia nutans [Arthur]

EUPHORBIA nutans Lag. (Uromyces euphorbiae C. & P. uredo), *see* Uromyces euphorbiae C. & P. aecidiospores from Euphorbia nutans Lag. [Arthur]

FARLOW, W. G. The Development of the Gymnosporangia of the United States [General account of results of cultures by himself, Thaxter, Halsted, and some European botanists.] Bot. Gaz. 11:234-241. Sept. 1886.

FARLOW, W. G. Development of Roestelia from Gymnosporangia. [Preliminary notice of Thaxter's work.] Bot. Gaz. 11:189-190. July 1886.

FARLOW, W. G. The Gymnosporangia or Cedar Apples of the United States. Anniv. Mem. Boston Soc. Nat. Hist. 1880, 38:1-38. Pl. 1-2. 1880.

FARLOW, W. G. Notes on some Species of Gymnosporangium and Chrysomyxa of the United States. Proc. Am. Acad. Arts & Sci. Boston, N. S. 12:311-323. 1885.

FESTUCA gigantea (Puccinia graminis tritici), *see* Puccinia graminis tritici uredospores from Triticum vulgare. [Carleton]

FESTUCA sp. indet. (Puccinia coronata Corda), *see* Puccinia coronata Corda uredospores from Avena sativa. [Carleton]

FRAXINUS viridis (Aecidium fraxini Schw.), *see* Puccinia peridermiospora (E. & T.) Arth. from Spartina cynosuroides. [Arthur]

- GYMNOCONIA interstitialis (Caeoma nitens Schw.) from Rubus occidentalis and R. villosus (Gymnoconia interstitialis teleuto [Puccinia peckiana Howe] on Rubus occidentalis and R villosus). G. W. Clinton. Bot. Gaz. 20: 116. March 1895.
- GYMNOCONIA interstitialis (Puccinia peckiana Howe teleuto on Rubus occidentalis and R. villosus), *see* Gymnoconia interstitialis (Caeoma nitens Schw.) from Rubus occidentalis and R villosus. [Clinton]
- GYMNOSPORANGIUM biseptatum from [Cupressus thyoides] (Roestelia botryapites on Amelanchier canadensis). Roland Thaxter. Proc. Amer. Acad. Arts & Sci. Boston, 14: 263. (Separate) Jan. 1887.
- GYMNOSPORANGIUM biseptatum from [Cupressus thyoides] (————? spermogonia on Amelanchier canadensis). W. G. Farlow. Proc. Amer. Acad. Arts & Sci. Boston, N. S. 12:316. 1885.
- GYMNOSPORANGIUM biseptatum from Cupressus thyoides (————? spermogonia on Crataegus tomentosa). W. G. Farlow. Annivers. Mem. Boston Nat. Hist. 1880:35. 1880.
- GYMNOSPORANGIUM clavariaeforme DC. from Juniperus communis L. (Roestelia botryapites Schw. on Amelanchier [canadensis] and A. botryapium). Byron D. Halsted. Bull. Bot. Dept. State Agr. Coll. Iowa [1887]:90-2. Feb. 1888.
- GYMNOSPORANGIUM clavariaeforme from [Juniperus communis] (Roestelia lacerata on Crataegus tomentosa). Roland Thaxter. Proc. Am. Acad. Arts & Sci. Boston, 14:262. (Separate) Jan. 1887.
- GYMNOSPORANGIUM clavipes from [Juniperus virginiana] (Roestelia aurantiaca on Amelanchier canadensis and Pyrus malus spermogonia only). Roland Thaxter. Proc. Am. Acad. Arts & Sci. Boston, 14:264. (Separate) Jan. 1887.
- GYMNOSPORANGIUM conicum from [Juniperus virginiana] (Roestelia cornuta on Amelanchier canadensis and Pyrus malus (spermogonia only). Roland Thaxter. Proc. Am. Acad. Arts & Sci. Boston, 14:264. (Separate) Jan. 1887.
- GYMNOSPORANGIUM clavipes from [Juniperus virginiana] (————? spermogonia on Amelanchier canadensis, Pyrus arbutifolia and P. malus). W. G. Farlow. Proc. Am. Acad. Arts & Sci. Boston, N. S. 12:316. 1885
- GYMNOSPORANGIUM ellisii from [Cupressus sp.] (Roestelia transformans (?) on Pyrus arbutifolia and (?) Amelanchier canadensis). Roland Thaxter. Proc. Am. Acad. Arts & Sci. Boston, 14:264 (Separate) Jan. 1887.

- GYMNOSPORANGIUM globosum from Juniperus [virginiana] (Roestelia "lacerata z" [R. globosum Thax. as later used] on Pyrus malus, Pyrus americana and Crataegus crus-galli). Roland Thaxter. Conn. Agr. Exp. Sta. Bull. 107:4. 15 Apr. 1891.
- GYMNOSPORANGIUM globosum from [Juniperus virginiana] (Roestelia sp.? (spermogonia only) on Crataegus coccinea, Pyrus americana and Pyrus malus.) Roland Thaxter. Proc. Am. Acad. Arts & Sci. Boston, 14:263. (Separate) Jan. 1887.
- GYMNOSPORANGIUM globosum from Juniperus virginiana (————? spermogonia on Crataegus oxycantha, C. douglasii and Pyrus malus). W. G. Farlow. Proc. Am. Acad. Arts & Sci. Boston, N. S. 12:316. 1885.
- GYMNOSPORANGIUM globosum from Juniperus virginiana (————? spermogonia on Crataegus tomentosa). W. G. Farlow. Annivers. Mem. Boston Soc. Nat. Hist. 1880:34. 1880.
- GYMNOSPORANGIUM macropus from Juniperus virginiana (Roestelia [penicillata] on Pirus coronaria). Byron D. Halsted. Bot. Gaz. 11:190. July 1886. Bull. Iowa Agr. Coll. Bot. Dept. 1886:59-61. 1887.
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- JUNIPERUS communis (*Roestelia lacerata* on *Crataegus tomentosa*), *see* *Gymnosporangium clavariaeforme* from [*Juniperus communis*]. [Thaxter]
- JUNIPERUS virginiana (*Roestelia aurantiaca* on *Amelanchier canadensis* and *Pyrus malus* [spermogonia]), *see* *Gymnosporangium clavipes* from [*Juniperus virginiana*]. [Thaxter]
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- JUNIPERUS virginiana (Roestelia [penicillata] on Pirus coronaria), *see* Gymnosporangium macropus from Juniperus virginiana. [Halsted]
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KOELERIA cristata (*Puccinia graminis tritici*), *see* *Puccinia graminis tritici* uredospores from *Triticum vulgare*. [Carleton]

LARIX decidua Mill. [*L. europæa* DC.] (spermogonia and aecidia [Cæoma]), *see* *Melampsora medusae* Thüm. teleutospores from *Populus deltoides* Marsh. [Arthur]

LARIX europæa DC., *see* *Larix decidua* Mill..

LEPTILON canadense (L.) Britt. (*Puccinia caricis-erigerontis* Arth. aecidia), *see* *Puccinia caricis-erigerontis* Arth. from *Carex festucacea* Willd. [Arthur]

LEPTILON canadense (L.) Britt. (*Puccinia caricis-erigerontis* Arth. aecidia, *see* *Puccinia caricis-erigonertis* Arth. from *Carex festucacea* Willd.

LESPEDAZA capitata Mx. (*Aecidium leucospermum* B. & C.), *see* *Uromyces lespedezae-procumbentis* (Schw.) Curt. teleutospores from *Lespedeza capitata*. [Arthur]

LESPEDAZA capitata Mx. (spermogonia and aecidia on *Lespedeza capitata*), *see* *Uromyces lespedezae-procumbentis* (Schw.) Curt. teleutospores from *Lespedeza capitata* Mx. [Arthur]

LYCOPUS americanus (*Aecidium lycopi* Ger.), *see* *Puccinia angustata* Pk. from *Scirpus atrovirens*. [Arthur]

LYCOPUS americanus Muhl. (*Puccinia angustata* Pk. aecidia [*Aecidium lycopi* Ger.]), *see* *Puccinia angustata* Pk. from *Scirpus atrovirens* Muhl. [Kellerman]

LYCOPUS americanus (*Puccinia angustata* Pk. uredo on *Scirpus atrovirens*), *see* *Puccinia angustata* Pk. aecidiospores [*Aecidium lycopi* Ger.] from *Lycopus americana*. [Arthur]

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MUHLENBERGIA mexicana (Aecidium hibisciatus Schw. on Hibiscus moscheutos), *see* Puccinia hibisciata (Schw.) Kellerm. (P. muhlenbergiae Arth., P. windsoriae Burr. non Schw.) from Muhlenbergia mexicana [Kellerman]

OATS, *see* Avena sativa.

OENOTHERA biennis L., *see* Onogra biennis (L.) Scop.

ONAGRA biennis (L.) Scop. (Oenothera biennis L.) (Aecidium peckii DeT.), *see* Puccinia peckii (DeT.) Kellerm. from Carex trichocarpa Muhl. [Arthur]

ONAGRA biennis (L.) Scop. (Oenothera biennis L.) Aecidium peckii DeToni (Ae. oenotherae Pk.), *see* Puccinia peckii (DeToni) Kellerm. n. n. (P. caricina DC. p. p.) from Carex trichocarpa. [Kellerman]

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PENTSTEMON pubescens (Aecidium pentstemonis Schw.), *see* Puccinia americana Lagh. from Andropogon scoparius. [Arthur]

PENTSTEMON pubescens (Puccinia americana Lagh. uredo on Andropogon scoparius), *see* Puccinia americana Lagh. aecidiospores [Aecidium pentstemonis Schw.] from Pentstemon pubescens. [Arthur]

PENTSTEMON hirsutus ([Aecidium pentstemonis] spermogonia), *see* Puccinia andropogonis Schw. from Andropogon scoparius. [Kellerman]

PENTSTEMON hirsutus (L.) Willd. (spermogonia and aecidia), *see* Puccinia andropogonis Schw. teleutospores from Andropogon scoparius Mx. [Arthur]

PHALARIS arundinacea (Puccinia coronata Corda), *see* Puccinia coronata Corda uredospores from Avena sativa. [Carleton]

PHALARIS caroliniana (Puccinia coronata Corda), *see* Puccinia coronata Corda aecidium from Rhamnus lanceolata. [Carleton]

PHASEOLUS diversifolius Pers. *see* Strophostyles helvola (L.) Britt.

PHLEUM pratense (Puccinia coronata Corda), *see* Puccinia coronata Corda uredospores from Avena sativa. [Carleton]

- PHRAGMIDIUM speciosum Fr. spermogonia on *Rosa humilis*, *see* *Phragmidium speciosum* Fr. from *Rosa* (hardy garden rose). [Arthur]
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- PHRAGMITES communis Trin., *see* *Phragmites phragmites* (L.) Karst. [Arthur]
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- PHRAGMITES phragmites (aecidia [*Aecidium rubellum* Pers.] on *Rumex altissimus*), *see* *Puccinia phragmitis* (Schum.) Körn. from *Phragmites phragmites*. [Bates]
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- PIRUS malus cult. (*Roestelia pirata*), *see* *Gymnosporangium macropus* from *Juniperus virginiana*. [Stewart & Carver]
- PLANTAGO rugelii (*Aecidium plantaginis* Ces [?]), *see* *Uromyces aristidae* E. & E. from *Aristida oligantha* Mx. [Arthur]
- POLYPOGON monspeliensis (*Puccinia coronata* Corda), *see* *Puccinia coronata* Corda uredospores from *Avena sativa*. [Carleton]
- POPULUS deltoides Marsh. (spermogonia and aecidia [*caeoma*] on *Larix decidua* Mill. (*L. europaea* DC.)), *see* *Melampsora medusae* Thüm. teleutospores from *Populus deltoides*. [Arthur]
- PTELEA trifoliata (*Aecidium pteleae*), *see* *Puccinia windsoriae* Schw. from *Tricuspis seslerioides*. [Kellerman]
- PTELEA trifoliata L. (*Puccinia windsoriae* Schw. aecidia [*Aecidium pteleae* B. & C.]), *see* *Puccinia windsoriae* Schw. from *Tricuspis seslerioides* Torr. (*Triodia cuprea* Jacq.). [Arthur]

PTELEA trifoliata (*Puccinia windsoriae* Schw. uredo on *Triodia cuprea* (*Sieglingia sesleriodes* Scrib.), *see* *Puccinia windsoriae* Schw. aecidiospores (*Aecidium pteleae* (*Aecidium pteleae* B. & C.) from *Ptelea trifoliata*. [Arthur]

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- PUCCINIA atkinsoniana Diet., synonym of P. sambuci (Schw.) Arth. n. n.
- PUCCINIA atkinsoniana and P. bolleyana are identical and synonyms of P. sambuci (Schw.) nom. nov. [J. C. Arthur. Bot. Gaz. 35:15. Jan. 1903.]
- PUCCINIA bartholomaei Diet. [P. jamesiana (Pk.) Arth. n. n.] from Atheropogon curtispendus Fourn. (Bouteloua curtipendula Torr.) (Aecidium jamesianum on Aecidium jamesianum on Asclepias incarnata and A. syriaca L.). J. C. Arthur. Bot. Gaz. 35:18. Jan. 1903.
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- PUCCINIA caricina DC. from Carex trichocarpa, *see* Puccinia peckii (DeToni) Kellerm. n. n. [P. caricina DC. p. p.] from Carex trichocarpa. [Kellerman]
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- PUCCINIA caricis (Schum.) Reb. aecidia on Urtica gracilis, *see* Puccinia caricis (Schum.) Reb. from Carex stricta Lam. [Arthur]
- PUCCINIA caricis-asteris Arth. aecidia on Aster paniculatus, *see* Puccinia caricis-asteris Arth. from Carex foenea Willd. [Arthur]
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- PUCCINIA caricis-erigerontis Arth. aecidia on Leptilon canadense (L.) Britt., *see* Puccinia caricis-erigerontis Arth. from Carex festucacea Willd. [Kellerman]
- PUCCINIA caricis-solidaginis Arthur n. n. from Carex jamesii Schw. (Aecidium solidaginis Schw. on Solidago canadensis L., S. caesia L. (spermogonia), S. rigida L. (spermogonia), S. serotina Ait., and S. ulmifolia Muhl. (spermogonia). J. C. Arthur. Bot. Gaz. 35:21. Jan. 1903.
- PUCCINIA caricis-solidaginis Arth. n. n. (Puccinia on Carex jamesii Schw. and C. stipata Muhl., and Aecidium solidaginis Schw.). J. C. Arthur. Bot. Gaz. 35:21. Jan. 1903.
- PUCCINIA caricis-solidaginis Arthur n. n. from Carex stipata Muhl. (Aecidium solidaginis Schw. on Solidago canadensis and S. serotina). J. C. Arthur. Bot. Gaz. 35:21. Jan. 1903.
- PUCCINIA caricis-solidaginis Arth. aecidia on Solidago canadensis L., *see* Puccinia caricis-solidaginis Arth. from Carex stipata Muhl. [Kellerman]
- PUCCINIA caricis-solidaginis Arth. from Carex stipata Muhl. (Puccinia caricis-solidaginis Arth. aecidia on Solidago canadensis L.). W. A. Kellerman. Jour. Mycol. 9:228. Dec. 1903.
- PUCCINIA caulicola Tr. & Gall. (aecidia [Aecidium caulicolum Kellerm.] on Salvia lanceolata Willd.), *see* Puccinia caulicola Tr. & Gall. teleutospores from Salvia lanceolata Willd. [Kellerman]
- PUCCINIA caulicola Tr. & Gall. teleutospores from Salvia lanceolata Willd., (Puccinia caulicola Tr. & Gall. aecidia [Aecidium caulicolum Kellerm.] on Salvia Salvia Willd.). W. A. Kellerman. Jour. Mycol. 9:227. Dec. 1903.
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- PUCCINIA chrysanthemi Roze uredospores from Chrysanthemum indicum (Puccinia chrysanthemi Roze uredo on Chrysanthemum indicum). J. C. Arthur. Ind. Agr. Exp. Sta. Bull. 85:145. Oct. 1900.
- PUCCINIA chrysanthemi Roze uredospores on Chrysanthemum indicum, *see* Puccinia chrysanthemi Roze uredo from Chrysanthemum indicum. [Arthur]
- PUCCINIA cirsii-lanceolati Schroet. teleutospores from Carduus lanceolatus L. (Puccinia cirsii-lanceolati Schroet. aecidia [Aecidium cirsii-lanceolati Kellerm.] uredo and teleuto on Carduus lanceolatus L.). W. A. Kellerman. Jour. Mycol. 9:229. Dec. 1903.
- PUCCINIA cirsii-lanceolati Schroet. aecidia [Aecidium cirsii-lanceolati Kellerman] uredo and teleuto on Carduus lanceolatus L., *see* Puccinia cirsii-lanceolati Schroet. teleutospores from Carduus lanceolatus L. [Kellerman]
- PUCCINIA convolvuli Cast. from Convolvulus sepium (Aecidium calystegiae Desm. on Convolvulus sepium). J. C. Arthur. Bot. Gaz. 29:270. April 1900.
- PUCCINIA coronata Corda on Alopecurus alpestris, Anthoxanthum odoratum, Avena fatua, A. pratensis, A. sativa, Dactylis glomerata, Eatonia sp. indet., Festuca sp. indet., Koeleria cristata, Phalaris arundinacea, Phleum pratense, Polypogon monspeliensis, *see* Puccinia coronata Corda uredospores from Avena sativa. [Carleton]
- PUCCINIA coronata Corda on Avena sativa, Phalaris caroliniana, Arrhenatherum elatius, *see* Puccinia coronata Corda aecidium from Rhamnus lanceolata. [Carleton]
- PUCCINIA coronata Corda aecidiospores from Rhamnus lanceolata (Puccinia coronata Corda on Avena sativa, Phalaris caroliniana, Arrhenatherum elatius.) Mark Alfred Carleton. U. S. Dept. Agr. Div. Veg. Phys. & Path. Bull. 16:48. 27 Sept. 1899.
- PUCCINIA coronata Corda uredospores from Avena sativa (Puccinia coronata Corda on Alopecurus alpestris, Anthoxanthum odoratum, Avena fatua, A. pratensis, A. sativa, Dactylis glomerata, Eatonia sp. indet., Festuca sp. indet., Koeleria cristata, Phalaris arundinacea, Phleum pratense, Polypogon monspeliensis). Mark Alfred Carleton. U. S. Dept. Rgr. Div. Veg. Phys. & Path. Bull. 16:46-7. 27 Sept. 1899.
- PUCCINIA eatoniae Arth. n. n. on Eatonia pennsylvanica (DC.) A. G.), *see* Aecidium ranunculi Schw. from Ranunculus abortivus L. [Arthur]

- PUCCINIA fraxinata (Lk.) Arth. n. n. for P. atkinsoniana Diet. & P. bolleyana Sacc. [Arthur]
- PUCCINIA graminis on Avena sativa, *see* Puccinia graminis uredospores from Avena sativa. [Hitchcock & Carleton]
- PUCCINIA graminis on Avena sativa, *see* Puccinia graminis uredospores from Triticum vulgare. [Hitchcock & Carleton]
- PUCCINIA graminis uredospores from Avena sativa (Puccinia graminis on Avena sativa). A. S. Hitchcock & M. A. Carleton. Kans. Exp. Sta. Bull. 46:3. May 1894.
- PUCCINIA graminis on Hordeum distichum, *see* Puccinia uredospores from Triticum vulgare. [Hitchcock & Carleton]
- PUCCINIA graminis on Triticum vulgare, *see* Puccinia graminis uredospores on Triticum vulgare. [Hitchcock & Carleton]
- PUCCINIA graminis uredospores from Triticum vulgare (Puccinia graminis on Avena sativa). A. S. Hitchcock & M. A. Carleton. Kans. Exp. Sta. Bull. 46:3. May 1894.
- PUCCINIA graminis uredospores from Triticum vulgare (Puccinia graminis on Hordeum distichum.) A. S. Hitchcock & M. A. Carleton. Kans. Exp. Sta. Bull. 46:3. May 1894.
- PUCCINIA graminis uredospores from Triticum vulgare (Puccinia graminis on Triticum vulgare). A. S. Hitchcock & M. A. Carleton. Kansas Exp. Sta. Bull. 46:3. May 1894.
- PUCCINIA graminis tritici [Aecidium], *see* Aecidium berberidis. [Carleton]
- PUCCINIA graminis tritici on Elymus canadensis, E. can. glaucifolius, Triticum vulgare, *see* Puccinia graminis tritici uredospores from Elymus canarensis glaucifolius. [Carleton]
- PUCCINIA graminis tritici uredospores from Elymus canadensis glaucifolius (Puccinia graminis tritici on Elymus canadensis, E. canadensis glaucifolius, Triticum vulgare). Mark Alfred Carleton. U. S. Dept. Agr. Div. Veg. Phys. & Path. Bull. 16:55. 27 Sept. 1899.
- PUCCINIA graminis tritici on Hordeum [distichum], *see* Aecidium berberidis from Hordeum [distichum]. [Carleton]
- PUCCINIA graminis tritici from Hordeum jubatum (Puccinia graminis tritici on Triticum vulgare). Mark Alfred Carleton. U. S. Dept. Agr. Div. Veg. Phys. & Path. Bull. 16:55. 27 Sept. 1899.
- PUCCINIA graminis tritici on Triticum vulgare, Festuca gigantea, Agropyron richardsoni, Triticum monococcum, Hordeum [distichum], Koeleria cristata, *see* Puccinia graminis tritici uredospores from Triticum vulgare. [Carleton]

- PUCCINIA graminis tritici on Triticum vulgare, *see* Puccinia graminis tritici-uredospores from Hordeum jubatum. [Carleton]
- PUCCINIA graminis tritici from Triticum vulgare (Puccinia graminis tritici on Triticum vulgare, Festuca gigantea, Agropyron richardsoni, Triticum monococcum, Hordeum [distichum], Koeleria cristata). Mark Alfred Carleton. U. S. Dept. Agr. Div. Veg. Phys. & Path. Bull. 16: 54-5. 27 Sept. 1899.
- PUCCINIA helianthi Schw. aecidia on Helianthus mollis and H. annuus L., *see* Puccinia helianthi Schw. from Helianthus mollis Lam. [Kellerman]
- PUCCINIA helianthi Schw. from Helianthus mollis Lam. (Puccinia helianthi Schw. aecidia on Helianthus mollis Lam. and H. annuus L. W. A. Kellerman. Jour. Mycol. 9:230. Dec. 1903.
- PUCCINIA helianthi Schw. from Helianthus grosse-serratus Mart. (Puccinia helianthi Schw. on Helianthus grosse-serratus Mart. and H. maximiliani Schrad.). J. C. Arthur. Bot. Gaz. 35:17. Jan. 1903.
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- PUCCINIA helianthi from Helianthus [sp.] (Aecidium on Helianthus [sp.]). M. A. Carleton. Science, N. S. 12:250. 15 Feb. 1901.
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- PUCCINIA hibisciata (Schw.) Kellerm. from Muhlenbergia mexicana (L.) Trin. (Puccinia hibisciata (Schw.) Kellerm. aecidia on Hibiscus militaris Cav.) W. A. Kellerman. Jour. Mycol. 9:32. Dec. 1903.
- PUCCINIA hibisciata (Schw.) Kellerm. aecidia on Hibiscus militaris Cav., *see* Puccinia hibisciata (Schw.) Kellerm. from Muhlenbergia mexicana (L.) Trin. [Kellerman]
- PUCCINIA hibisciata (Schw.) Kellerm. n. n. (P. muhlenbergiae Arth., P. windsoriae Burr. non Schw.) from Muhlenbergia mexicana (Aecidium hibisciatum Schw. on Hibiscus moscheutos). W. A. Kellerman. Jour. Mycol. 9:109, 232. May, Dec. 1903.
- PUCCINIA hydnoidea (B. & C.) Arth. n. n. on Bromus ciliatus L., *see* Aecidium hydnoideum B. & C. from Dirca palustris L. [Arthur]

- PUCCINIA impatientis (Schw.) Arthur n. n. (*Puccinia rubigovera* p. p. [on *Elymus virginicus*]). [J. C. Arthur. Bot. Gaz. 35:19. Jan. 1903.]
- PUCCINIA impatientis (Schw.) Arthur n. n., *see* *Puccinia rubigovera* [*P. impatientis* (Schw.) Arthur n. n. from *Elymus virginicus* L.] [Arthur]
- PUCCINIA impatientis (Schw.) Arth. teleutospores from *Elymus virginicus* L. (spermogonia and aecidia on *Impatiens aurea* Muhl.). J. C. Arthur. Jour. Mycol. 10:11. Jan. 1904.
- PUCCINIA jamesiana (Pk.) Arth. nom. nov. (*Puccinia bartholomaei* Diet. and *Aecidium jamesianum* Pk. [J. C. Arthur. Bot. Gaz. 35:18. Jan. 1903.]
- PUCCINIA lateripes B. & Rav. aecidiospores [*Aecidium lateripes*] from *Ruellia strepens* (*Uredo* and teleuto on *Ruellia strepens*). W. A. Kellerman. Jour. Mycol. 9:107 and 234. May, and Dec. 1903.
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- PUCCINIA muhlenbergiae Arth., *see* *P. hibisciata* (Schw.) Kellerm. n. n. [Kellerman]
- PUCCINIA osmorrhizae on *Chaerophyllum procumbens* and (?) *Washingtonia claytoni*, *see* *Aecidium osmorrhizae* Pk. from *Washingtonia claytoni*. [Kellerman]
- PUCCINIA panici Diet. *uredo* on *Panicum virgatum*, *see* *Aecidium pammelii* Trel. from *Euphorbia corollata*. [Stuart]
- PUCCINIA peckii (DeT.) Kellerm. from *Carex trichocarpa* Muhl. *Aecidium peckii* DeT. on *Onagra biennis* (L.) Scop. (*Oenothera biennis* L.). J. C. Arthur. Bot. Gaz. 35:13. Jan. 1903.
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- PUCCINIA peridermiospora (E. & T.) Arth. from *Spartina cynosuroides* (*Aecidium fraxini* Schw. on *Fraxinus viridis*). J. C. Arthur. Bot. Gaz. 29:275. April 1900.
- PUCCINIA phragmitis (Schum.) Körn. from *Phragmites communis* (*Aecidium rubellum* Pers. on *Rumex crispus*, *R. obtusifolius*). J. C. Arthur. Bot. Gaz. 29:269. April 1900.

- PUCCINIA phragmitis (Schum.) Körn. from Phragmites phragmites (Aecidium rubellum Pers. on Rumex altissimus). John M. Bates. Jour. Mycol. 9:220. Dec. 1903.
- PUCCINIA poculiformis (Jacq.) Wettst. from Cinna arundinacea (Aecidium berberidis on Berberis vulgaris). J. C. Arthur. Jour. Mycol. 8:53. June 1903.
- PUCCINIA pustulata (Curt.) Arth. n. n. teleutospores from Andropogon furcatus Muhl. and A. scoparius Mx. (spermatogonia and aecidia [Aecidium pustulatum Curt.] on Comandra umbellata (L.) Nutt.). J. C. Arthur. Jour. Mycol. 10:—. Jan. 1904.
- PUCCINIA rhamni (Pers.) Wettst., *see* P. coronata Corda.
- PUCCINIA rubigo-vera [P. impatientis (Schw.) Arthur n. n.] from Elymus virginicus L. (Aecidium impatientis Schw. on Impatiens aurea Muhl.) J. C. Arthur. Bot. Gaz. 35:18. Jan. 1903.
- PUCCINIA rubigo-vera on Triticum vulgare, *see* Puccinia rubigo-vera uredospores from Triticum vulgare. [Hitchcock & Carleton]
- PUCCINIA rubigo-vera uredospores from Triticum vulgare (Puccinia rubigo-vera on Triticum vulgare). A. S. Hitchcock and M. A. Carleton. Kans. Exp. Sta. Bull. 46:3. May 1894.
- PUCCINIA rubigo-vera secalis on Secalis cereale, *see* Puccinia rubigo-vera secalis uredo from Secalis cereale. [Carleton]
- PUCCINIA rubigo-vera secalis uredo from Secalis cereale (Puccinia rubigo-vera secalis on Secalis cereale). Mark Alfred Carleton. U. S. Dept. Agr. Div. Veg. Phys. & Path. Bull. 16:43. 27 Sept. 1899.
- PUCCINIA rubigo-vera tritici on Triticum vulgare, *see* Puccinia rubigo-vera tritici from Triticum vulgare. [Carleton]
- PUCCINIA rubigo-vera tritici uredo from Triticum vulgare (Puccinia rubigo-vera tritici on Triticum vulgare). Mark Alfred Carleton. U. S. Dept. Agr. Div. Veg. Phys. & Path. Bull. 16:20. 27 Sept. 1899.
- PUCCINIA sambuci (Schw.) Arth. n. n. (P. atkinsoniana Diet.) from Carex lurida Wahl. (Puccinia sambuci (Schw.) Arth. aecidia [Aecidium sambuci Schw.] on Sambucus canadensis). J. C. Arthur. Bot. Gaz. 35:15. Jan. 1903.
- PUCCINIA sambuci (Schw.) Arth. aecidia [Aecidium sambuci Schw.] on Sambucus canadensis, *see* Puccinia sambuci (Schw.) Arth. (P. atkinsoniana Diet.) from Carex lurida Wahl. [Arthur]

(To be Continued)

THE AMERICAN MYCOLOGICAL SOCIETY.

BY THE SECRETARY.

The mycologists present at the Washington meeting of the American Association for the Advancement of Science in 1902, held an informal conference to consider the advisability of forming an organization. The sentiment proved to be strongly in favor of such a movement, but it was felt that the matter should be carefully looked into before decisive steps were taken. Accordingly, a committee on organization, consisting of Messrs. Earle, Shear, and Clements, was appointed to correspond with the mycologists of the country, and learn their views on the project. This committee met immediately to formulate plans and to draw up a tentative list of those whose interest might be such as to make them favor such a society. In April a circular letter was sent to these, in which expressions were asked as to the desirability and the form of organization. The response was so general and so enthusiastic, that the committee decided to proceed in the matter of making definite plans for organizing at St. Louis. A second letter was issued in December, fixing a time for meeting, and calling attention to the fact that arrangements had been made with Section G, by which Wednesday morning of the session was set apart for a mycological program.

The meeting for organization was called to order at 4 P. M. Tuesday, December 29, 1903, in the Central High School. A temporary organization was effected by electing Professor Arthur chairman, and Dr. Clements secretary. The report of the committee was read by Mr. Shear; it was as follows:

“The committee appointed at the informal meeting of the mycologists held at Washington last winter beg leave to submit the following report. Letters were sent to twenty-five mycologists, presenting a tentative plan, and asking their opinion as to the desirability of the society and the form of organization, whether as an independent society or a sub-section. Answers have been received from twenty-four of these, all heartily favoring the movement. As there was considerable diversity of opinion as to the form of the society, the committee has thought it best to suggest that an independent organization be perfected at present, but with the express purpose of affiliating as a section when feasible. Your committee has seen fit to call a meeting with a view to organization at this time, as the needs of our work and the sentiment of mycologists seem amply to justify such action. Through the courtesy of Section G, a mycological program has been arranged for Wednesday morning. Letters to this effect have been sent out to the mycologists, and in nearly every case replies have been received, expressing approval of the course.

In order to further facilitate permanent organization, your committee submits herewith the tentative draft of a constitution, together with proposals for committees upon charter membership; upon terminology, chromotaxia, etc., and upon affiliation with other botanical societies."

The report of the committee was accepted, with the exception of the provision relating to constitution, and the committee was discharged. It was moved by Professor Atkinson, seconded and carried, that the meeting organize permanently under a simple set of rules. It was also moved and carried that the meeting proceed to the election of a president, vice-president, and a secretary-treasurer, to serve to the close of the next annual meeting, and that the ballot be *viva voce*.

The following officers were elected: President, Dr. Thaxter, Harvard; Vice President, Dr. Earle, New York; Secretary-treasurer, Dr. Clements, Nebraska. It was moved and carried that the president be empowered to appoint a committee of three to consider plans of affiliation with the other societies. The president asked for an expression of opinion in regard to the matter of affiliation, in the course of which it was evident that the society was a unit in favor of such a step. The committee appointed consists of Mr. Shear, Professor Atkinson, and Professor Burrill. Dr. Farlow raised the question of the membership of the society, and it was finally determined that those present as well as those to whom the circular letters were sent should be considered charter members, upon signifying their intention, and upon the payment of the assessment of one dollar. The meeting then adjourned.

The mycologists present were Arthur, Atkinson, Burrill, Clements, Clinton, Duggar, Farlow, Fink, Freeman, Hedgcock, Kellerman, Macbride, Shear, Thaxter, Tracy.

The papers presented Wednesday morning were as follows:

The Genus *Harpochytrium*; Its Development, Synonymy and Distribution. G. F. Atkinson.

The Phylogeny of Lichens. F. E. Clements.

The Necessity of Reform in the Nomenclature of Fungi. F. S. Earle.

The Taxonomic Value of the *Spermogonium*. J. C. Arthur.

Proof of the Identity of *Phoma* and *Phyllosticta* on the Sugar Beet. G. G. Hedgcock.

Unpublished Notes on the Uredineae. M. A. Carleton.

Craterellus taxophilus, a New Species of Thelephoraceae. C. Thom.

Fungi Cultivated by Texas Ants. A. M. Ferguson.

Symbiosis in *Lolium*. E. M. Freeman.

In the afternoon of the same day the following mycological papers were, by courteous arrangement, read before the Botanical Society:

Cultures of Uredineae in 1903. J. C. Arthur.

Uredineous Infection Experiments in 1903. W. A. Kellerman.

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NOTES.

IT is a pleasure to record the fact that a Society of Mycologists was organized at St. Louis, during the recent meeting of the A. A. A. S. A full account of the organization has been furnished by the secretary, and is published in this number of the JOURNAL.

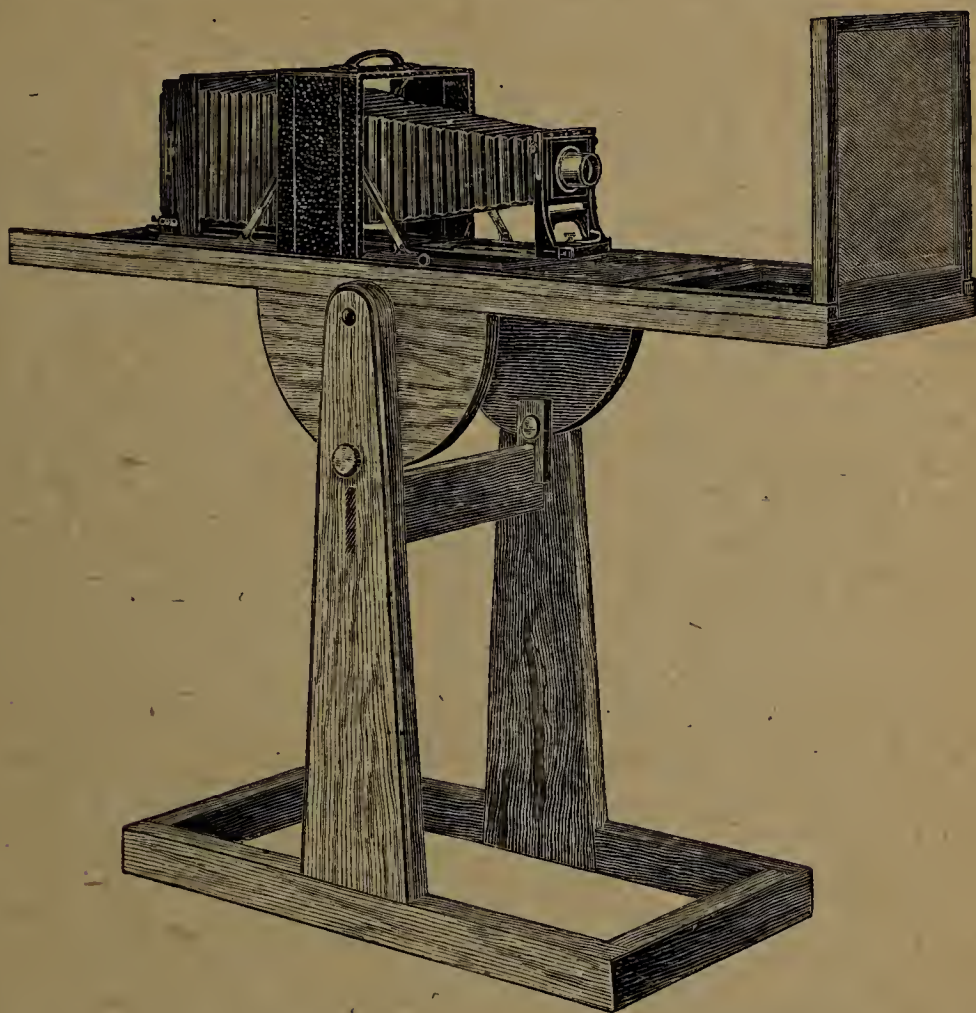
THE tender of the office of president of the Society to the eminent mycologist and President-elect of A. A. A. S., Dr. W. G. Farlow, elicited an expression of his hearty approval of the organization, though he was constrained to decline the honor because of pressing duties. Dr. Roland Thaxter was then made the presiding officer by a unanimous vote.

THE formation of a new scientific society when it has already been hinted that too many now are in existence, suggests the statement that perhaps unity of interest and purpose—as in case of this newly formed mycological society — should be the basis of all the organizations.

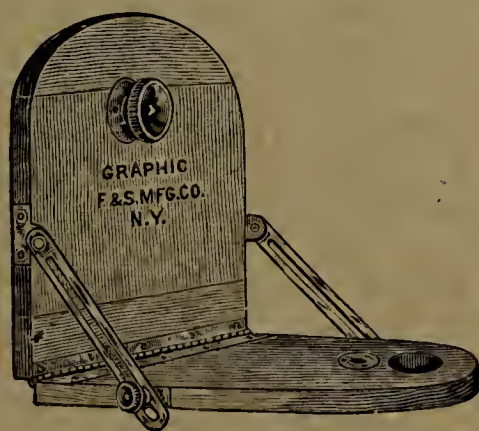
A READJUSTMENT of the numerous affiliated Societies and Sections of A. A. A. S., perhaps possible, surely desirable—may be, involving cleavage along new lines in some cases—ought to remove present friction and better subserve the interests of all.

IN connection with the matter it may be added, that it is perhaps too much to expect, or even to hope, that all mycological papers—whether detailing research work, or discussing phases of this branch of botany—may be read before this newly formed Mycological Club; in the latter at any rate the purely technical matters, and important topics such as bibliography and publication, nomenclature, group limits, etc., may be discussed to mutual advantage, and concerted action and uniform practice now and then induced.

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A NEW MELOGRAMMA.

A. P. MORGAN.

MELOGRAMMA PATENS Morgan n. sp.—Stroma depressed-pulvinate, cinereous then black, the surface mammillate by the numerous subjacent perithecia. Perithecia, small, ovoid, papillate, lying in a single layer. Asci cylindric, with a short stalk, octosporous, paraphysate, 120-130 x 7-9 mic.; spores fusiform, slightly curved, 3-septate, yellow-brown, 18-22 x 6-7 mic.

Growing on dead branches of *Carpinus americana*, Preston, Ohio, 1896. Stromata gregarious, seated on the inner bark and erumpent through the periderm, 2-3 mm. in diameter, containing from 50 to more than 100 perithecia.

The nearest relative to this species appears to be *Melogramma caucasicus* Jaczewski. The common *Melogramma vagans* DeNot. grew along with it on the same branches, sometimes mingled together, but the difference between them is perfectly obvious to the naked eye.

SOME FUNGI COLLECTED IN NEW MEXICO.

T. D. A. COCKERELL.

For several years I have been preparing a catalogue of the fungi of New Mexico; but it is still hardly more than a fragment, and I do not suppose I shall ever be able to make it anything better, now that I have moved to Colorado. It contains, however, some records which seem worth publishing, as additions

to the New Mexico flora, new host-records, etc., and these are presented herewith. I give in every case the name of the mycologist who kindly identified my material. The material was collected by myself, except when the collector's name is cited.

- Agaricus campestris L. Pecos (W. P. Cockerell).
Coprinus atramentarius (Bull.) Fr. Pecos (M. Grabham).
Coprinus micaceus (Bull.) Fr. Pecos (Mrs. Cora W. Hewett.)
Stropharia stercoraria Fr. det. Peck. Pecos, prox. 6800 ft.
Polyporus arcularius (Batsch) Fr. det. Peck. Pecos.
Geaster hygrometricus Pers. det. Ellis. Soledad Cañon, Organ Mts.
Geaster floriformis Rit. det. V. S. White. Las Vegas Hot Springs, prox. 7000 ft.
Chondrioderma floriforme (Bull.) Bosc. det. Ellis. Beulah, prox. 8000 ft.
Trichothecium roseum Fr. det. Ellis. Mesilla, on dead wood of *Sambucus mexicana*.
Plowrightia morbosa (Schw.) Sacc. det. F. W. Patterson. Placita, near Las Vegas, on *Prunus demissa*.
Erysiphe communis (Wallr.) Fr. det. Patterson. Las Vegas, on *Polygonum*.
Erysiphe cichoracearum DC. det. Patterson. Pecos, on *Verbena macdougalii* Heller.
Pseudopeziza medicaginis (Lib.) Sacc. det. Patterson. Roswell, on alfalfa.
Tubercularia vulgaris Tode. det. Patterson. Placita, on *Prunus demissa*.
Peridermium ephedrae Cke. det. Ellis. East of Las Cruces, on *Ephedra trifurca*.
Phyllachora dasyliirii (Pk.) det. Ellis. Soledad Cañon, on *Dasyliirion wheeleri*.
Melampsora farinosa (Pers.) det. Ellis. Sante Fé, on *Salix*.
Phragmidium rubi (Pers.) Wint. det. Earle. Las Vegas.
Phragmidium occidentale Arthur. det. Earle. Beulah, on *Rubus deliciosus*.
Phragmidium speciosum Fr. det. Patterson. Pecos, on *Rosa pecosensis* Ckll.
Uredo ribicola C. & E. det. Ellis. Las Vegas.
Uromyces scaber E. & E. det. Ellis. Las Vegas, perhaps on *Stipa vaseyi*.
Uromyces limonii DC. (probably) det. Ellis. Nine miles south of Tularosa, on *Limonium limbatum* Small.
Uromyces hyalinus Pk. det. Earle. Las Vegas, on *Sophora sericea*.

- Aecidium lepidii* Tr. & Gall. det. Ellis. Hagerman (Pecos Valley), on *Lepidium alyssoides*.
Aecidium ranunculacearum DC. det. Earle. Las Vegas, on *Ranunculus cymbalaria*.
Aecidium sommerfeltii Johans. det. Earle. Beulah, on *Thalictrum fendleri* Engelm.
Aecidium hydrophylli Pk. det. Earle. Beulah, on *Hydrophyllum fendleri* (Gray) Heller.
Aecidium allenii Clinton det. Earle. Beulah, on *Lepargyrea canadensis*.
Aecidium aquilegiae Pers. det. Earle. Beulah, on *Aquilegia*. (Coll. W. P. Cockerell.)
Aecidium phaceliae Pk. det. Earle and Patterson. Beulah, on *Phacelia cercinata*.
Aecidium brandegei Pk. det. Earle. Las Vegas, on *Asclepias*. (Coll. Clara Gerhardt.)
Aecidium monoicum Pk. det. Patterson. Las Vegas, on *Sophia incisa*, greatly distorting the plant.
Aecidium clematidis DC. det. Patterson. Pecos, on *Clematis ligusticifolia*.
Puccinia tanacetii DC. det. Ellis. Las Vegas.
Puccinia delphinii Diet. & Holw. det. Earle. Sapello Cañon, on *Delphinium sapellonis* Ckll.
Puccinia cryptandri Ell. & Barth. det. Earle. Las Vegas Hot Springs, on *Sporobolus cryptandrus*.
Puccinia gutierreziae E. & E. det. Ellis and Patterson. Glorieta, on *Gutierrezia sarothrae*; also at Mesilla, on *Isocoma wrightii*, and at Mescalero.
Puccinia helianthi, variety. det. Ellis. Mesilla, on *Helianthus ciliaris*.
Puccinia evadens Hark. det. Ellis. Mesilla, on *Baccharis glutinosa* Pers.
Puccinia veratri Niessl. det. Earle. Beulah, on *Veratrum*.
Puccinia xanthii Schw. det. Patterson. Roswell, on *Xanthium commune* Britton.
Puccinia sphaeralceae E. & E. det. Patterson. Roswell, on *Sphaeralcea cuspidata*; Pecos, on *Sphaeralcea fendleri lobata*.
Puccinia tosta Arthur det. Patterson. Albuquerque, on *Sporobolus asperifolius*.
Puccinia malvastri Pk. det. Patterson. Las Vegas, on *Malvastrium cockerelli* A. Nelson. Also Bovina, Texas, on the same plant.
Puccinia menthae Pers. (aecidial stage) det. Patterson. Pecos, on *Monarda stricta*.

NOTES ON CALIFORNIAN UREDINEÆ AND DESCRIPTIONS OF NEW SPECIES.

W. R. DUDLEY AND C. H. THOMPSON.

PUCCINIA ANACHORETA Hark. Bull. Calif. Acad. Sc. 1:34. Feb. 1884.

II. Hypophyllous, sori scattered, sparse or abundant, small, .5-2 mm. long, oblong, surrounded by the ruptured epidermis, light yellow; spores globose, 18-23 μ in diameter, walls rather thick, finely echinulate.

III. Hypophyllous, sori like those of II but separate from them though on the same leaf, very dark brown; spores dark brown, broadly elliptical, not at all constricted, or slightly so, at the septum, the two cells of equal size with rounded base and apex, walls rather thick, uniformly covered with minute hyaline tubercles; 29-33 x 34-40 μ ; pedicels hyaline, equaling the spore length, fragile, breaking away near the spore.

II. III. On leaves of Calochortus albus. Santa Cruz. May 1900. (Thompson).

This material was compared with the type material in the herbarium of the California Academy of Science and proved to be the same species with some variation in the size of the teleutospores. The original description gives the size as 20-24 x 28-42 μ but on measuring some of the type material we found the spores to be 27.5-32.5 x 31.2-37.5 μ . "Constricted" at the septum is certainly the exception and not the rule in both the type and in our own material. This adds the uredo stage to the published description.

PUCCINIA NODOSA Ell. & Hark. Bull. Calif. Acad. Sc. 1:27. Feb. 1884.

I. Amphigenous; spots oblong, 1-4 mm. long, conspicuous, orange-yellow; aecidia few, irregularly collected in groups, small, short, rising but slightly above the longitudinally split epidermis, borders very irregularly lacerated, not recurved; spores mostly globose, a few irregularly angular oblong to obovate, wall medium thick, very minutely tuberculate, 25-37.5 x 25-37.5 μ .

II. Amphigenous; scattered, small, oblong. 1 mm. long, pustulate, opening by a single split in the epidermis parallel with the leaf, the epidermis crowded back by the protruding spores but not ruptured, dark chestnut-brown; spores globose, oblong to obovate, walls minutely and closely echinulate, yellow, contents finely granular, orange colored, germ-pores several, scattered over the spore, 30-32.5 x 30-42.5 μ .

III. Amphigenous; sori mostly .5-1.5 mm. long, rarely 4 mm. long, by .5 mm. wide, pustulate, opening by a single longitudinal split, the epidermis crowded to either side, as a wall, by the protruding spores, black; spores mostly oblong to short ob-

long, rounded at base and apex though sometimes tapering in both, usually not constricted at the septum, occasionally slightly so, walls uniformly and moderately thick, very coarsely tuberculate, almost opaque black, $26.2-37.5 \times 47.5-70 \mu$; pedicel thick, half the length of the spore, hyaline, deciduous. Paraphyses present at border of sorus, irregularly bent clavate, hyaline.

The above description is made entirely from our own material and adds stages I and II to the published description. This material was compared with the type material in the Harkness herbarium of fungi in the California Academy of Science and found to be identical with it. Owing to the meagreness of the type material only a small number of spores could be examined. These measured $30-35 \times 43.7-50 \mu$, while in the original description they are given as $22-28 \times 36-42 \mu$. "Septum scarcely visible" was probably due to the almost opaque condition of the cell wall. The pedicel is also described "as long as the spore." A number of sections through the leaf of our material, having the spores attached, failed to show any equaling the spore length but all were quite uniformly half the length of the spore.

I. II. On *Brodiaea capitata*. Rocky point near Searsville Lake, San Mateo County. Jan. 24, 1904. (Thompson).

III. Same host and location as I. and II. April 19, 1903. (Thompson).

PUCCINIA MORENIANA Dudley & Thompson n. sp.

III. Hypophyllous; sori scattered, pustulate, round to long-oblong, $1-3 \times 1-12$ mm., for some time covered by the epidermis which at length breaks away irregularly, leaving the sori naked, pulverulent, chestnut-brown; spores very irregular in size and frequently so in shape, the more common form being oblong with rounded or obliquely tapering apex and rounded or tapering base, moderately constricted at the septum, $16.2-21.2 \times 30-40 \mu$, averaging $19 \times 35 \mu$. Variations in length and diameter give a measurement range of $16.2-25 \times 30-43.7 \mu$. Unicellular spores of various sizes and shapes are frequent. All spores are light brown, walls thin throughout, smooth; pedicel long, $30-60 \mu$, tapering, rough, fragile, readily breaking away at the spore.

On *Brodiaea capitata*, by the old cement mill, Searsville Lake, at the base of Sierra Morena, San Mateo County. April 19, 1903. (Thompson).

PUCCINIA MONARDELLAE Dudley & Thompson n. sp.

I. Causes a swollen distortion of the young twigs, either the whole or only the basal portion of the twig, the leaves on these parts correspondingly distorted; over the surface of both are scattered the aecidia; the swollen twigs have a purple epidermis; aecidia long and slender cylindrical with irregularly lacerated margins which are not recurved; spores irregularly angular, globose to oblong, very minutely and closely verrucose, con-

tents granular with conspicuously large oil globules, $16.2-25 \times 23.7-38.7 \mu$.

II. Hypophyllous, sori round, scattered, pale tawny yellow, small; spores globose to slightly angular, almost hyaline, minutely and sparsely echinulate, thin walls, contents granular, $22.5-25 \mu$ in diameter.

III. Hypophyllous, sori round, small, scattered or occasionally forming rings, black, pulverulent; spores very dark reddish brown, short elliptical, slightly or more usually not at all constricted at the septum, rounded at both base and apex, cells equal in size, walls rather thick, closely beset over both cells with medium large transparent papillae, $22.5-25 \times 25-31.2 \mu$; pedicel stout, hyaline or sometimes slightly colored next the spore, spatulate flattened near the base, about 5μ in diameter by $50-62.5 \mu$ long.

This species shows relationship to *P. menthae*, but a comparison of it with abundant material of the latter from both America and Europe shows many conspicuous and constant differences which readily separate it from that species, — the very dark brown teleutospores, the dense covering of papillae on the basal cell as well as the apical one, the absence of any prominent apical papilla, and the stout pedicel which is comparatively short and conspicuously spatulate flattened near the basal end.

On *Monardella villosa*, Santa Cruz, June-July 1902-3. (Thompson.) Searsville ridge, San Mateo County, Jan., Mar. 1903. (Thompson.) *M. undulata*, Point Reyes, July 1903. (Elmer.) Distributed under *Puccinia menthae* Pers. in *Fungi Columbiani*, no. 188 b, on *Monardella villosa*, Berkeley, June 1893. (Blasdale).

PUCCINIA MICROMERIAE Dudley & Thompson n. sp.

I. Aecidia closely scattered on under surface of the leaves and along the stem, diminishing the former in size and causing the latter to grow strictly erect (the normal branches being prostrate trailing); basal portion of the aecidia hemispherical, from the top of which extends the long white cylinder, $3-4.5 \times 5.6-10.5$ mm. irregularly jagged on the margin, not revolute, readily breaking away so that older individuals are much shorter; spores angular ovoid, oblong or globose hyaline, walls medium thick, minutely and closely verrucose, $16.2-21.2 \times 25-32.5 \mu$.

II. Hypophyllous; sori scattered or clustered, in the latter case somewhat discoloring a spot on the leaf to straw-yellow, small, round, pale pinkish yellow, fading on drying; spores mostly elliptical-oblong, frequently ovoid, nearly transparent, wall thin, finely echinulate, contents granular, $18.7-21.2 \times 25-30 \mu$.

III. Sori mostly on the angles of the trailing stems from which grow the distorted branches which bear the aecidia, rarely found on the under surface of the leaf on the veins, very small, $1.1-1.9 \times 3-3.7$ mm., dark brown, surrounded by ruptured epi-

dermis, spores very free (not crowded); spores reddish-brown, oblong, very slightly constricted at the septum, the two cells equal in size, walls thick, verrucose over the terminal cell and about half way down on the basal cell, base and apex round, a large low apical papilla frequently present but not at all conspicuous, $24-27.5 \times 29-34 \mu$; pedicel hyaline, tapering downward, $37.5-44 \mu$ long, fragile, usually breaking off to about the length of the spore.

Allied to *P. menthae* but differing in the aecidial stage in the strictly erect form of the distorted branches of the host, and the bulbous base of the aecidia; in the uredo stage in oblong spores, never globose; in the teleuto stage in the thick wall which is more thickly verrucose, the less prominent apical papilla, less marked constriction at the septum and greater size of the spores.

I. II. III. On *Micromeria chamissonis*, Santa Cruz, June-July, 1903. I. and II. very abundant, III. rarely found. (Thompson); II. Big River, Mendocino County, June 14, 1903. (McMurphy.)

UROMYCES ATRO-FUSCUS Dudley & Thompson n. sp.

I. Amphigenous; spots small, pale yellow; sori round to short elliptical, scattered or clustered but not at all confluent, standing out prominently from the host, brown-black.

II. Spores scattered among the teleutospores, not abundant, elliptical, $16-17.5 \times 25-26 \mu$, rather thickwalled, echinulate, germ-pores conspicuous, equatorial.

III. Spores dark brown, obovate or not infrequently globose, more or less rounded, angular, $19-26 \times 25-31 \mu$, wall thick, slightly more so at the apex, papillate, strongly so on the upper half of the spore but less so on the lower half; pedicel hyaline 2.5-3 times the length of the spore, but fragile and usually breaking away near the spore.

On *Carex douglasii*, near Palmers, Mariposa County, June 22, 1894. (J. W. Congdon.) *Carex usta*, Bear Valley, San Bernardino County, Aug. 7, 1902. (L. R. Abrams, no. 2920.)

OHIO FUNGI. FASCICLE IX.

W. A. KELLERMAN, OHIO STATE UNIVERSITY.

List of Species and Hosts.

161. *Bovista plumbea* Pers.
162. *Cercospora helianthi* E. & E., on *Helianthus hirsutus* Raf.
163. *Coleosporium campanulae* (Pers.) Lév., on *Campanula americana* L.
164. *Elfvigia megaloma* (Lév.) Murrill, on stumps and logs.
165. *Entyloma menispermii* Farl. et Trel., on *Menispermum canadense* L.
166. *Melampsora salicis-capreae* (Pers.) Wint., on *Salix nigra* Marsh.
167. *Peronospora parasitica* (Pers.) DeBary, on *Dentaria laciniata* Muhl.
168. *Plasmopara sordida* Berk., on *Scrophularia marylandica* L.

169. *Plasmopara viticola* (B. & C.) Berl. & DeT., on *Vitis* sp. cult. and *Vitis vulpina* L.
170. *Polyporus anax* Berk., on an old stump.
171. *Polystictus cinnabarinus* (Jacq.) Fr., on old logs, mostly cherry.
172. *Puccinia albiperidia* Arthur, on *Carex pubescens* Muhl.
173. *Puccinia angustata* Pk., on *Scirpus atrovirens* Muhl.
174. *Puccinia caricis-solidaginis* Arth., on *Carex stipata* Muhl.
175. *Puccinia polygoni-amphibii* Pers., on *Polygonum virginianum* L.
176. *Puccinia seymeriae* Burrill, on *Afzelia macrophylla* (Nutt.) Kuntze.
177. *Pucciniastrum agrimoniae* (DC.) Diet., on *Agrimonia mollis* (T. & G.) Britt.
178. *Septoria lactucae* Pass., on *Lactuca virosa* L.
179. *Septoria ochroleuca* B. & C., on *Castanea dentata* (Marsh.) Borkh.
180. *Synchytrium decipiens* Farl., on *Falcata comosa* (L.) Kuntze.

161. *Bovista plumbea* Pers.

Columbus, Ohio.

October 1903.

Coll. J. H. Schaffner.

"BOVISTA PLUMBEA: minor subglobosa plumbeo-caesia. *Obs. myc.* 1. p. 5.

"Iam aestate post pluuias crescere incipit, cortice exteriori candido adhuc involuta, qui demum vt plurimum aut totus euanescent, aut de quo basi particulae stellariformes, modo eleganti, remanent. Autumno matura, colore plumbea, libera aut terrae vix innata, non infrequens reperitur." D. C. H. Persoon. *Synopsis Methodica Fungorum, Pars Prima*, 137. 1801.

162. *Cercospora helianthi* E. & E.

On *Helianthus hirsutus* Raf.

Sandusky, Erie Co., Ohio.

Aug. 2, 1903.

Coll. W. A. Kellerman.

"CERCOSPORA HELIANTHI, E. & E.—Spots none; hyphae hypophyllous, fasciculate, olive-brown, nucleate, becoming septate, crooked above, 70-90 x 5-6 μ , forming loose, olivaceous, indefinitely-limited patches; conidia obclavate, olivaceous, nucleate, becoming 3-6-septate, 70-110 x 5-6 μ ." J. B. Ellis & B. M. Everhart. *Journal of Mycology*, 3:20. Feb., 1887.

163. *Coleosporium campanulae* (Pers.) Lev.

On *Campanula americana* L.

Columbus, Ohio.

June, 1903.

Coll. W. A. Kellerman.

"VREDO CAMPANULAE: Rotunda subdepressa flauo-rubra magnitudine varia.

"OBS. Color demum, quod etiam de multis speciebus valet, ita expallescent, vt fungilli fere albidus euadant. Nonnunquam vero puluerem in vno alteroue indiuiduo eiusdem cespituli observauimus colore spadiceo distinctum." D. C. H. Persoon. *Synopsis Methodica Fungorum, Pars Prima*, 217. 1801.

164. *Elfvingia megaloma* (Lev) Murrill.

On stumps and logs.

Columbus, Ohio.

Oct. 1902-3.

Coll. Kellerman, Schaffner, Jennings, Frank.

"POLYPORUS (Fomentarius) LEUCOPHAEUS M. mss.: dimindatus; pileo maximo suberoso-lignoso convexo-plano tuberculato-noduloso glabro, tandem concentrice sulcato, crustaceo-laccato, ex albo lacteo cinerascens, lineolis obscurioribus fasciato, margine obtuso lactea sterili; poris minimis primo niveis tandem fuscescentibus, ore intusque albis.

"HAB. Ad truncos Americae borealis. Ohio: SULLIVANT.

"DESC. Pileus dimidiato-sessilis, semiorbicularis, maximus, transversim 3 decimetra latus, 13-15 centim. longus, postice fere decimetrum crassus, laccatus seu crusta rigida sat crassa industus, initio lacteus, lineolis cinereis concentricis marginem versus notatus, tandem cinerascens et superficiem *Stereii fasciati* SCHW. referens. Margo obtusus, late sterilis, ut et hymenium junius, candidus. Substantia durissima, floccoso-suberosa, badia. Pori longissimi, omnium minutissimi, intus nivei, ore obtuso eadem materia, qua totus fungus premitus est vestitus, initio obturati, dein obducti." J. F. Cam. Montagne. Sylloge Generum Specierumque Cryptogamarum, 157. 1856.

165. *Entyloma menispermi* Farl. et Trel.On *Menispermum canadense* L.

Sandusky, Erie Co., Ohio.

July 5, 1903.

Coll. W. A. Kellerman.

'ENT. MENISPERMI Farlow and Trelease.

"Conidia acutely ovate, 11-24 μ by 3.5-4 μ . Spores light colored, globose or somewhat angular, smooth, with thin walls, about 5.5-11 μ in diameter." W. G. Farlow. Botanical Gazette, 8:275. Aug., 1883.

166. *Melampsora salicis=capreæ* (Pers.) Wint.On *Salix nigra* Marsh.

Columbus, Ohio.

Sept. 20, 1903.

Coll. W. A. Kellerman.

Supplement to No. 47.

167. *Peronospora parasitica* (Pers.) DeBary.On *Dentaria laciniata* Muhl.

Columbus, Ohio.

May 5, 1903.

Coll. W. A. Kellerman.

"Botrytis parasitica: cespitosa candida, stipite deorsim simplice." D. C. H. Persoon. Observationes Mycologicae, 1:96, pl. 5. f. 6. a. b. 1796.

168. Plasmopara sordida Berk.

On *Scrophularia marylandica* L.

Sandusky, Erie Co., Ohio.

Aug. 3, 1903.

Coll. W. A. Kellerman.

"*Peronospora sordida* n.sp. Maculis latis hypophyllis irregularibus sordide pallidis; floccis supra vage dichotomis, apicibus furcatis inaequalibus; sporis obovatis apice apiculatis.

"Forming broad, irregular, dirty, pallid spots on the under side of the leaves; threads loosely dichotomous above; tips forked, unequal; spores obovate, apiculate, .001 inch long." Berkeley and Broome. *Annals and Magazine of Natural History*, III. 7:449. 1861.

169. Plasmopara viticola (B. & C.) Berl. & DeT.

On (a) *Vitis* sp. cult., on leaves only; (b) *Vitis vulpina* L., on fruit only.

Columbus, O. (a), Sandusky, O. (b). June 10, 1900.

Coll. W. A. Kellerman.

"*P.[eronospora] viticola* (Berk. et Curt.) *Botrytis viticola* Berk. et Curt. apud Caspary, *Monastber. Berl. Acad.*; Berkeley, *Crypt. Bot.*, p. 301.

Mycelii tubi crassi, saepe constricti varicosique (haustoria non vidi). Stipites conidiferi fasciculatim e stomatibus emergentes, graciles, elati, summo apice parum attenuato brevissime semel bisve dichotomi v. trifurcati; sub apice ramos plerumque 4-6 (raro 3 v. 7) gerentes. Rami primarii plerumque alterno, distantes et exacte distichi, omnes pro stipitis altitudine breves; inferiores plerumque trifurcati divisionibus iterum bis trifurcatis v. quandoque bis dichotomis; ramuli ultimi (quarti) ordinis, aequae ac stipitis divisiones apicales, brevissime conico-subulati recti, acuti. Rami primarii superiores minores, inferiorum secundariis v. tertiariis conformes. Rami omnium ordinum angulis rectis patentes, primarii in uno plano divaricati, planum ramificationum secundi ordinis in primario, tertiariorum in primario et secundario perpendiculare. (Rarius rami primarii 2 inferiores oppositi sunt, raro ramulis 2 ulterius muniti nec trifurcati, rarissime rami primarii irregulariter sparsi nec distichi sunt.) Conidia parvula, ovoidea, apice lato rotundata v. subtruncata, pavilla destituta, membrana circumcirca aequali hyalina.

Oogonia parva, membrana tenui hyalina v. lutescente oosporam foventia subglobosam episporio tenui fuscescente diaphano laevi munitam.

Habitat in America boreali, in *Vitis aestivalis* Mich., et *V. Labruscae* L. folus, ibique (teste cl. Russell in schedula) mensibus Augusto et Septembri abundat. Specimina a cl. Curtis in Carolina australi et a cl. J. L. Russel in civitate Massachusetts lecta cl. Caspary benevole mecum communicavit.

Stipites conidiferi in foliorum pagina inferiore caespites sistunt candidos densos, maculas ibi praebentes numerosas saepe confluentes. Merito sane a cl. Berkeley (l. c.) haec species distinctissimis et nobilissimis adscribitur, neque tamen caeteris "perfectior" dici potest." A. De Bary. *Ann. Sci. Nat.* IV. 20:125-126. 1863.

170. Polyporus anax Berk.

On an old stump.

Columbus, Ohio.

Oct. 20, 1902.

Coll. J. G. Sanders.

"Polyporus (Merisma) anax, Berk.

"Polyporus very much and intricately branched, the branches terminating in numerous frondose lobed pilei of various forms and sizes, imbricating and confluent, of a dusky gray, or lead colour, and somewhat downy or minutely fibrous above. The pores are white, varying in size and form, but mostly large and angular. The substance is coriaceous, brittle when dry. The smell is like that of mice, when it is in a dry state, but when moist almost inodorous.

"Found at the base of a dead stump, branching out from a thick single stem at the base, until at the top it formed a large head of branches and lobed pilei quite 16 inches in diameter. Ohio, U. S. Herb. Berk., No. 2458." M. C. Cooke. Grevillea, 12:37. 1883.

171. Polystictus cinnabarinus (Jacq.) Fr.

On old logs, mostly cherry.

Columbus, Ohio.

September 1903.

Coll. W. A. Kellerman, J. H. Schaffner, J. G. Sanders.

"Boletus cinnabarinus.

"Arboribus parasiticus accrescit in subalpinis Austriae; quem ex Carinthia etiam reverendus Franciscus Xaverius Wulfen transmisit. Fungus sessillis & horizontalis, superne convexo-planus, ruber & aequabilis; subtus planus, tenuissime nec profunde tubulosus, coccineusque; carne firma, coriacea, tenace, subrubella, aliquot lineas crassa. Antrorsum haud valde protenditur; latitudine variare a me visus ab unica ad quatuor uncias. Color in affervato diu jam perstitit." N. J. Jacquin. Florae Austriacae, 4:2. pl. 304. 1776.

172. Puccinia albiperidia Arthur.

On Carex pubescens Muhl.

Columbus, Ohio.

October 1902.

Coll. W. A. Kellerman.

'PUCCINIA ALBIPERIDIA SP. NOV.

"O. Spermogonia amphigenous, small, pale orange.

"I. Aecidia hypophyllous, small in circular clusters; substratum scarcely thickened; peridia white, low, margin incised, reflexed; spores pale yellow when fresh, subglobose, 15-20 μ in diameter; wall thin, smooth.

"II. Uredosori hypophyllous, small, round or oblong, soon naked; uredospores oblong, small, echinulate.

"III. Teleutosori hypophyllous, globose or oblong, pulvinate, dark brown. Teleutospores oblong-cuneate, 17-24 by 32-45 μ ; apex semi-circular or obtuse, thickened to half the length of the upper cell; side walls thin, slightly or not constricted; pedicel slender, colored, as long as the spore or shorter." J. C. Arthur. Journal of Mycology, 8:53. June, 1902.

173. *Puccinia angustata* Pk.

On *Scirpus atrovirens* Muhl.

Edgerton, Williams Co., O. Sept. 15, 1902.

Coll. W. A. Kellerman.

Supplement to No. 26.

174. *Puccinia caricis-solidaginis* Arth.

On *Carex stipata* Muhl.

Buckeye, Lake, Licking Co., Ohio. Nov. 1, 1902.

Coll. W. A. Kellerman.

For information concerning this rust see culture work by J. C. Arthur, in which he used teleutospores from *Carex jamesii* Schw. and from *Carex stipata* Muhl., obtaining aecidia on *Solidago canadensis* L. and *S. serotina* Ait. He then adds as follows:

"A comparison of this special with *P. caricis-asteris* and *P. caricis-erigerontis* [see labels 89 and 150] shows many resemblances, and it seems not improbable that the three represent more correctly the biological variations of one species." J. C. Arthur. *Botanical Gazette*, 35-21. January, 1903.

175. *Puccinia polygoni-amphibii* Pers.

On *Polygonum virginianum* L.

Sandusky, Erie Co., Ohio. July 25, 1903.

Coll. W. A. Kellerman.

Supplement to No. 115.

176. *Puccinia seymeriae* Burrill.

On *Afzelia macrophylla* (Nutt.) Kuntze.

Sandusky, Erie Co., Ohio. Aug. 3, 1903.

Coll. O. E. Jennings.

"*P. seymeriae*, Burrill.

"III. Hypophyllous, and on stems and calyces. Spots definite, dark-colored, sori rather large, mostly crowded in conspicuous circular clusters a fifth of an inch in diameter, these sometimes confluent, dark brown; spores elliptical or oval, little constricted, obtusely rounded at the ends, smooth, wall firm, brown, 15-21 by 30-36 μ ; pedicel hyaline, broad, persistent, twice as long as the spore." T. J. Burrill. *Bulletin of the Illinois State Laboratory of Natural History*, 2:188. 1885.

177. *Pucciniastrum agrimoniae* (DC.) Diet.

On *Agrimonia mollis* (T. & G.) Britt.

Sandusky, Erie Co., Ohio. Aug. 1, 1903.

Coll. W. A. Kellerman.

Supplement to No. 116.

178. Septoria lactucae Pass.On *Lactuca virosa* L.

Columbus, Ohio.

May 1903.

Coll. W. A. Kellerman.

"Septoria Lactucae Pass., nov. spec.

"Maculae ferrugineae, irregulares, angulosae, totam folii laminam mox adurentes; perithecia minima, punctiformia, sparsa; spermatia filiformia, integra, recta vel culvula, hyalina." G. Passerini. Erbar. crittog. ital., ser. II. No. 746. 1878.

Note The same description (with the word "spora" added in parenthesis after spermatia) is given on the label in Thümen, Mycoth. univ. N. 1295. The date of the latter, however, is 1879.

179. Septoria ochroleuca B. & C.On *Castanea dentata* (Marsh.) Borkh.

Sandusky, Erie Co., Ohio.

July 25, 1903.

Coll. W. A. Kellerman.

"Septoria ochroleuca. B. & C.—Maculis parvis orbicularibus peritheciisque ochroleucis marginatis; sporis curvis utrinque acutis uniseptatis.

"Spots small, pale, surrounded by a thin, dark margin; perithecia ochroleucous, collapsed, spores curved, subfusiform, uniseptate, .001 long." M. J. Berkeley. Grevillea, 3:9. September, 1874.

180. Synchronium decipiens Farl.On *Falcata comosa* (L.) Kuntze.

Sandusky, Erie Co., Ohio.

July 9, 1903.

Coll. W. A. Kellerman.

"UREDO ÆCIDIOIDES *n. sp.*

"Spots obliterated, sori amphigenous, bullate, small, scattered or close; spores globose, at first covered by the epidermis, then surrounded by its ruptured remains, bright yellow or orange 1/1200' in diameter.

"Leaves, petioles and stems of *Amphicarpaea monoica*. Common. June and July.

"When the sori are evacuated, the rather firm epidermis walls remain, forming a little cup with a narrow mouth and resembling the cups of some species of *Aecidium*." Charles H. Peck. Report on the N. Y. State Museum, 24:88. 1871.

Through inadvertancy an incorrect transcription was made for the label for No. 157, which is therefore to be discarded and the following label used instead.

157. Marssonina toxicodendri (E. & M.) Sacc.On *Rhus radicans* L.

Sandusky, Erie Co., O.

Aug. 17, 1903.

Coll. W. A. Kellerman.

"GLOEOSPORIUM TOXICODENDRI, E. & M., n. s.

"Spots amphigenous, dirty white, small (2 mm.) with a rather broad, nearly black border. Acervuli scattered, not numerous, dark colored. Spores oblong, 1-septate, 12-15 x 5-6 μ ." [corrected, 20-40 x 2½-3, mostly 22 x 30]. J. B. Ellis and B. M. Everhart. Journal of Mycology, 1:116. September, 1885.

By a clerical error *Stylosanthes biflora* (L.) B. S. P. was given as the host for No. 53. Please clip out from the reprint the host named below and paste same over the incorrect name on the label in the OHIO FUNGI *exsiccati*:

Strophostyles helvola (L.) Britt.

MINOR MYCOLOGICAL NOTES. III.

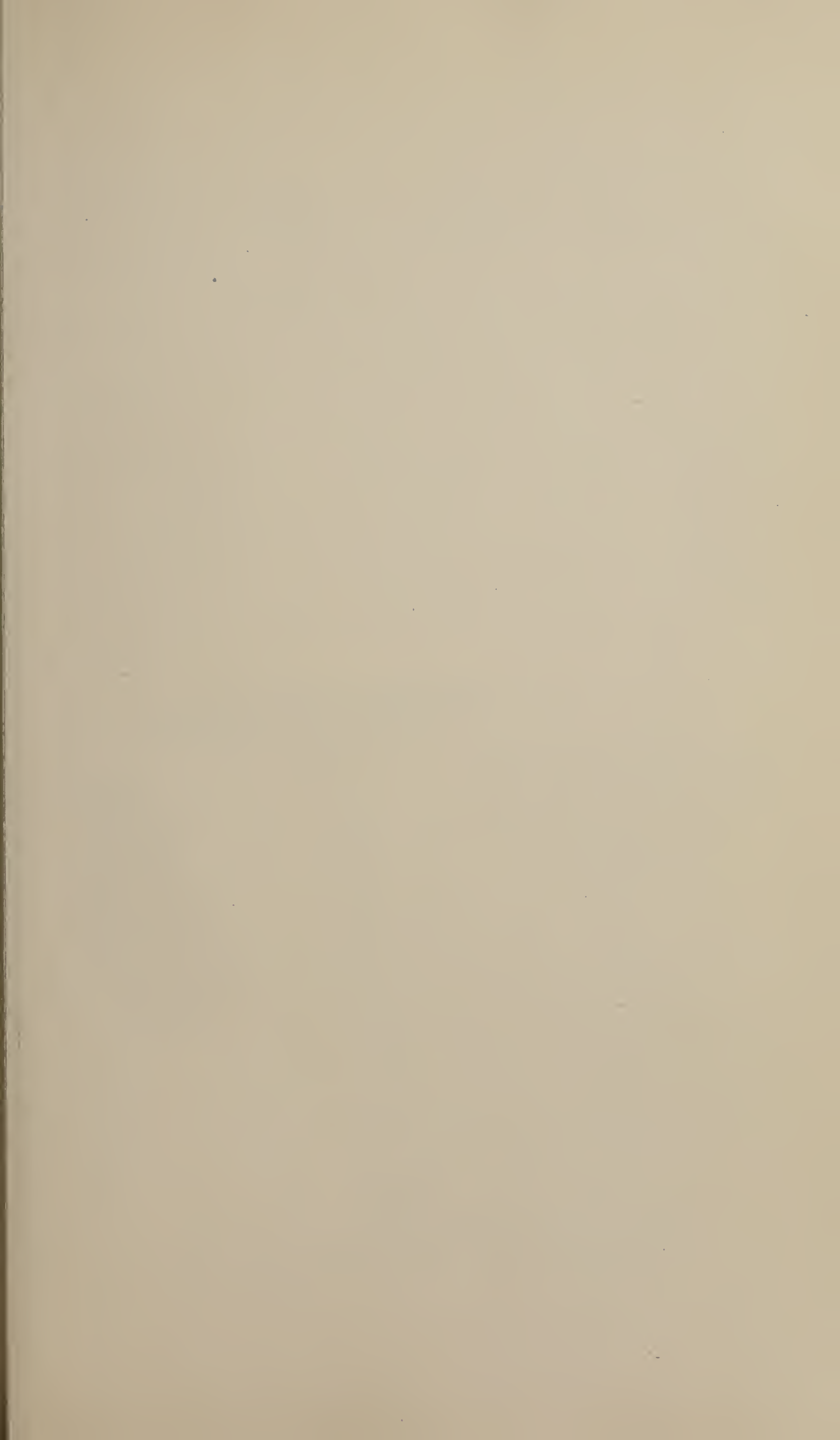
W. A. KELLERMAN.

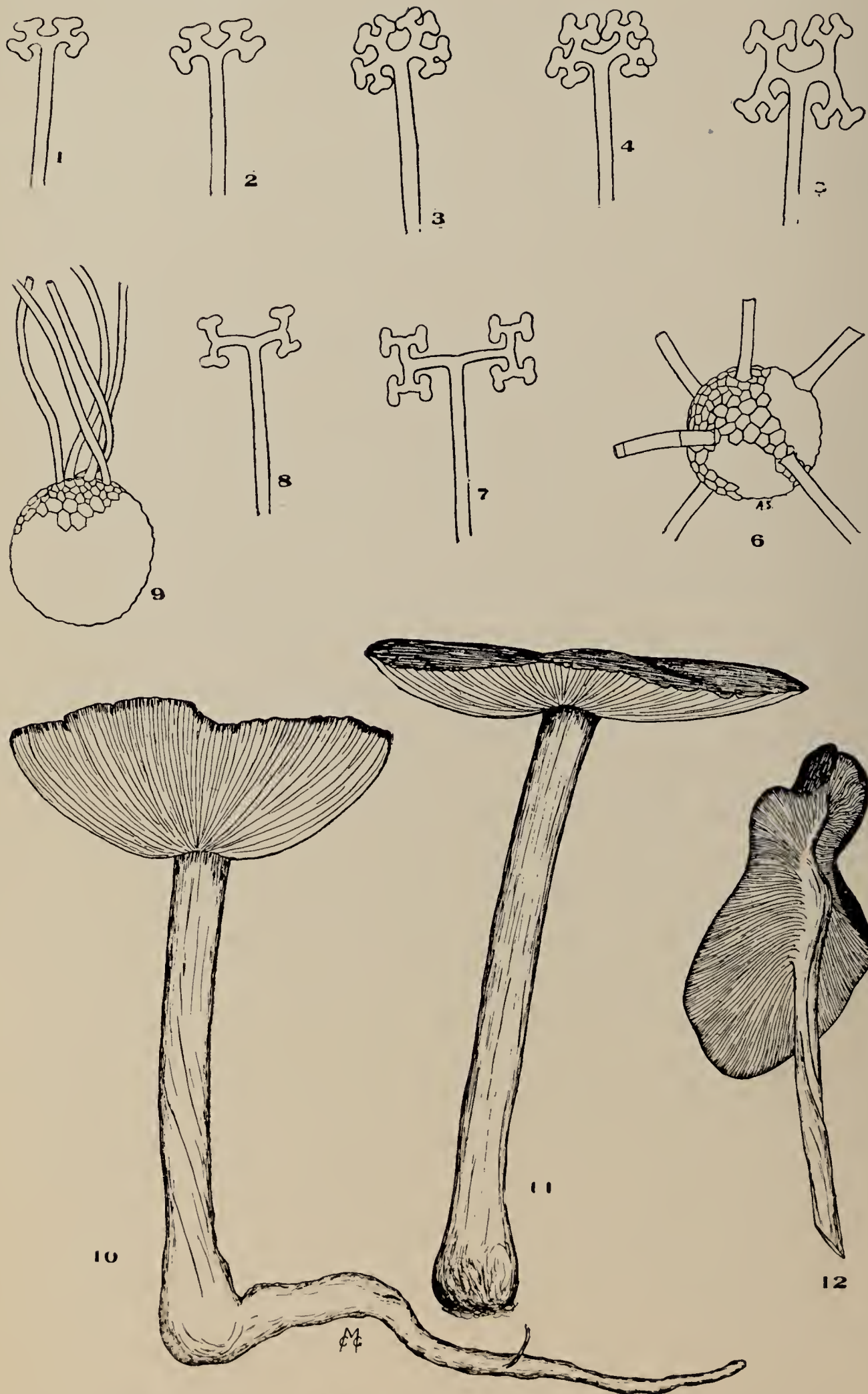
PODOSPHAERA TRIDACTYLA. — Having occasion to refer to herbarium specimens of *Podosphaera* recently, I was surprised to find that most of them named *P. kunzei*, *P. tridactyla* or *P. oxyacanthae* var. *tridactyla*, were not the form authoritatively named as last given. This is a repetition of the decision published by Salmon in his Monograph of the Erysiphaceae, in Mem. Torr. Bot. Club, 11:37 4 Oct. 1900, where he states as follows: "Without exception all the plants labelled *P. kunzei* (the name under which Lévillé united '*P. tridactyla*' and '*P. myrtillina*') that I have seen, belong to *P. oxyacanthae*."

Of the American specimens examined — more than 100, widely distributed over the United States — labelled *P. kunzei*, *P. oxyacanthae*, *P. oxyacanthae* var. *tridactyla*, and *Microsphaera fulvo-fulva*, all prove to be typical *P. oxyacanthae* (DC.) DeBary.

Mrs. Flora W. Patterson kindly allowed me to examine a specimen from Seattle, Wash., on *Spiraea douglasii*, originally labelled *Sphaerotheca humili*, which Salmon pronounced *P. oxyacanthae* var. *tridactyla*. The same mycologist of the United States Department of Agriculture also gave me the opportunity to examine 46 other specimens variously labeled as mentioned in the first part of this note. The specimens similarly labeled, in the Missouri Botanical Garden Herbarium were likewise generously placed at my service for critical examination. I have to thank in addition the Carnegie Museum and other parties for similar kindness with reference to their specimens.

All American specimens proved to be *Podosphaera oxyacanthae* — the only *P. tridactyla* found being the Seattle specimen alluded to above. Several European specimens labeled *P. tridactyla* and *P. oxyacanthae* were examined and generally found true to name. When labeled *P. kunzei* they were readily referred to *P. oxyacanthae*, or to *P. tridactyla*. It is thought remarkable, if not quite inexplicable, that *P. tridactyla* should be found on the single host and in the single locality in this country.





PODOSPHÆRA OXYACANTHÆ, P. TRIDACTYLA, AND CALLYBIA RADICATA.

I have been impressed with the marked characteristics of *P. tridactyla* — especially the location and direction of the appendages, and their striking dichotomal tips — and do not hesitate to label this form as a true species, not a variety of *P. oxyacanthae* as is done in Salmon's Monograph.

Referring to Earle's "Notes on the North American forms of *Podosphaera*," in the Botanical Gazette, 9:25-6, Feb. 1884, it is to be observed that this mycologist evidently did not have any true *P. tridactyla*; the decision that all his forms represented only one species was undoubtedly correct and he properly retained the name *Podosphaera oxyacanthae* (DC.) DeBary. The portion of his statement of interest here is as follows: "The differences that do appear are chiefly in the size of the perithecia and in the number and length of the appendages. As these vary more widely in perithecia from the same leaf than do the averages of the different forms, there seems no ground for their separation into distinct species, unless we allow more weight to the difference of host plant than is usual in the *Erysiphei*; but they should be considered as belonging to a large, widespread, variable species, comparable with *Erysiphe lamprocarpa*, Lév. and *Microsphaera penicillata*, Lév."

It has seemed desirable, even if my "note" is somewhat lengthened, to furnish the evidence for the opinion above expressed as to the autonomy of the form under consideration; accordingly outline figures have been reproduced on Plate 73. The Figs. 1-6, sufficiently explained below, represent *P. oxyacanthae*. In marked contrast to these are Figs. 7-9, which represent *P. tridactyla* — Fig. 7 drawn from a European specimen, and Figs. 8 and 9 from the Seattle (Washington) specimen. The dichotomal tip has its branches placed *at right angles* and usually they are much elongated — never so directed in *P. oxyacanthae*. The *apical insertion* of the appendages which are erect — at least more or less so — is also characteristic (Fig. 9). There is no approach to the more or less equatorial or basal insertion, and horizontally spreading appendages as in the case of *P. oxyacanthae* (Fig. 6).

Those interested in the synonymy would consult Salmon's complete list in the Monograph. But it may here be remarked that Wallroth in 1838 named the plant *Alphitomorpha tridactyla*; in 1851 it was listed as *Podosphaera kunzei* by Léveillé — which includes the species under consideration as well as the typical *P. oxyacanthae*; in 1870 we find the following satisfactory designation: *PODOSPHAERA TRIDACTYLA* (Wallr.) DeBary.

EXPLANATION OF FIGS. 1-9, Plate 73.

Fig. 1 shows tip of appendage of *Podosphaera oxyacanthae*, specimen from West Virginia (Millspaugh). Fig. 2, ditto, from Missouri (Tracy & Galloway). Figs. 3 and 4, ditto, from Kansas (Kellerman & Swingle). Fig. 5, ditto, from Maine (Ricker). Fig. 6, Perithecium from *P. oxyacanthae*, S. Dakota (Griffiths). Fig. 7, tip of appendage of *P. tridactyla* from Germany (Krieger). Fig. 8, ditto, from Seattle, Washington (Parker). Fig. 9, Perithecium also from latter specimen.

ABNORMAL COLLYBIA RADICATA. — When collecting Mushrooms near Sandusky, Ohio, the past season, some specimens of *Collybia radicata* were found in peculiar habitat, but they had adjusted themselves advantageously to the situation. They were growing on a rotten log, only the upper side of which had completely rotted away. The specimens were unable to send their "root" into the rotten wood, and in one case no such prolonged stipe was developed. In the other specimen the root-like portion, peculiar to this species, took a horizontal direction, applying itself closely to the moist surface of the decaying log. Sketches of these two abnormal forms are shown in Figs. 10 and 11, Plate 73. On the same plate is shown a specimen from a distant locality in which the cap is tipped up on one side by the abnormal lateral growth of the apical portion of the stipe; see Fig. 12.

INDEX TO UREDINEOUS CULTURE EXPERIMENTS WITH LIST OF SPECIES AND HOSTS FOR NORTH AMERICA. I.

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(Concluded from p. 45.)

- PUCCINIA sambuci (Schw.) Arth. n. n. aecidiospores [*Aecidium sambuci* Schw.] from *Sambucus canadensis* (*Puccinia sambuci* (Schw.) Arth. [*P. bolleyana* Sacc.] uredo on *Carex trichocarpa*.) J. C. Arthur. Bot. Gaz. 35:15. Jan. 1903.
- PUCCINIA sambuci (Schw.) Arth. aecidia (*Aecidium sambuci* Schw. on *Sambucus canadensis*), see *Puccinia sambuci* (Schw.) Arth. (*P. bolleyana* Sacc.) from *Carex trichocarpa* Muhl. [Arthur]
- PUCCINIA sambuci (Schw.) Arth. [*P. bolleyana* Sacc.] uredo on *Carex trichocarpa*, see *Puccinia sambuci* (Schw.) Arth. aecidiospores (*Aecidium sambuci* Schw.) from *Sambucus canadensis*. [Arthur]
- PUCCINIA sambuci (Schw.) Arth. n. n. (*P. bolleyana* Sacc.) from *Carex trichocarpa* Muhl (*Puccinia sambuci* (Schw.) Arth. aecidia [*Aecidium sambuci* Schw.] on *Sambucus canadensis*). J. C. Arthur. Bot. Gaz. 35:15. Jan. 1903.
- PUCCINIA simillima Arth. from *Phragmites phragmites* (L.) Karst. (*P. communis* Trin.) (*Aecidium ranunculacearum* (?) on *Anemone canadensis*). J. C. Arthur. Bot. Gaz. 35:20. Jan. 1903.
- PUCCINIA subnitens Diet. from *Distichlis spicata* (L.) Greene (*Aecidium ellisii* Tr. & Gall. on *Chenopodium album* L.). J. C. Arthur. Bot. Gaz. 35:19. Jan. 1903.

- PUCCINIA subnitens Diet. from *Distichlis spicata* (L.) Greene (aecidia [*Aecidium ellisii* Tr. & Gall.] on *Chenopodium album* L. W. A. Kellerman. Jour. Mycol. 9:234. Dec. 1903.
- PUCCINIA verbenicola (K. & S.) Arth. n. n., *see* *Puccinia vilfae* A. & H. [*P. verbenicola* (K. & S.) Arth.] from *Sporobolus longifolius* (Torr.) Wood. [Arthur]
- PUCCINIA vilfae A. & H. aecidia [*Aecidium verbenicola* K. & S.] on *Verbena stricta* Vent. and *V. urticifolia* L., *see* *Puccinia vilfae* A. & H. [*P. verbenicola* (K. & S.) Arth.] from *Sporobolus longifolius* (Torr.) Wood. [Arthur]
- PUCCINIA vilfae A. & H. aecidiospores (*Aecidium verbenicola* K. & S.) from *Verbena stricta* (*Puccinia vilfae* A. & H. uredo on *Sporobolus longifolius*). J. C. Arthur. Bot. Gaz. 29:274. April 1900.
- PUCCINIA vilfae A. & H. [*P. verbenicola* (K. & S.) Arth. n. n. from *Sporobolus longifolius* (Torr.) Wood (*Puccinia vilfae* A. & H. aecidia [*Aecidium verbenicola* K. & S.] on *Verbena stricta* Vent. and *V. urticifolia* L.). J. C. Arthur. Bot. Gaz. 35:16. Jan. 1903.
- PUCCINIA vilfae A. & H. uredo on *Sporobolus longifolius*), *see* *Puccinia vilfae* A. & H. aecidiospores (*Aecidium verbenicola* K. & S.) from *Verbena stricta*. [Arthur]
- PUCCINIA windsoriae Schw. aecidia [*Aecidium pteleae* B. & C.] on *Ptelea trifoliata* L., *see* *Puccinia windsoriae* Schw. from *Tricuspis seslerioides* Torr. (*Triodia cuprea* Jacq.) [Arthur]
- PUCCINIA windsoriae Schw. aecidiospores (*Aecidium pteleae* B. & C.) from *Ptelea trifoliata* (*Puccinia windsoriae* Schw. uredo on *Triodia cuprea* (*Sieglingia seslerioides* Scrib.)). J. C. Arthur. Bot. Gaz. 32:273. April 1900.
- PUCCINIA windsoriae Schw. from *Tricuspis seslerioides* Torr. (*Triodia cuprea* Jacq.) (*Puccinia windsoriae* Schw. aecidia [*Aecidium pteleae* B. & C.] on *Ptelea trifoliata* L. J. C. Arthur. Bot. Gaz. 35:16. Jan. 1903.
- PUCCINIA windsoriae Schw. from *Tricuspis seslerioides* (*Aecidium pteleae* on *Ptelea trifoliata*). W. A. Kellerman. Jour. Mycol. 9:10. Feb. 1903.
- PUCCINIA windsoriae Schw. uredo on *Triodia cuprea* (*Sieglingia seslerioides* Scrib., *see* *Puccinia windsoriae* Schw. aecidiospores (*Aecidium pteleae* B. & C.) from *Ptelea trifoliata*. [Arthur]
- PUCCINIA windsoriae Burr. non Schw., *see* *P. hibisciata* (Schw.) Kellerm. n. n.

- PYRUS americana (Roestelia "lacerata z" [R. globosum Thax. as later used], *see* Gymnosporangium globosum from Juniperus [virginiana]. [Thaxter]
- PYRUS americana (Roestelia sp. ? spermogonia only), *see* Gymnosporangium globosum from [Juniperus virginiana]. [Thaxter]
- PYRUS arbutifolia (Roestelia transformans [?]), *see* Gymnosporangium ellisii from [Cupressus sp.]. [Thaxter]
- PYRUS arbutifolia (————? spermogonia), *see* Gymnosporangium clavipes from [Juniperus virginiana]. [Farlow]
- PYRUS arbutifolia (————? spermogonia), *see* Gymnosporangium macropus from Juniperus virginiana.]Farlow[
- PYRUS iowensis (Roestelia pyrata), *see* Gymnosporangium macropus from Juniperus virginiana. [Pammel]
- PYRUS malus (Roestelia "lacerata z" [R. globosum Thaxter as later used], *see* Gymnosporangium globosum from Juniperus [virginiana]. [Thaxter]
- PYRUS malus (————? spermogonia), *see* Gymnosporangium clavipes from [Juniperus virginiana]. [Farlow]
- PYRUS malus (————? spermogonia), *see* Gymnosporangium globosum from Juniperus virginiana. [Farlow]
- PYRUS malus (————? spermogonia), *see* Gymnosporangium macropus from Juniperus virginiana. [Farlow]
- PYRUS malus (spermogonia only) (Roestelia aurantiaca), *see* Gymnosporangium clavipes from [Juniperus virginiana]. [Thaxter]
- PYRUS malus (spermogonia only) (Roestelia cornuta), *see* Gymnosporangium conicum from [Juniperus virginiana]. [Thaxter]
- PYRUS malus (Roestelia pyrata), *see* Gymnosporangium macropus from [Juniperus virginiana]. [Thaxter]
- PYRUS malus (Roestelia sp.? spermogonia only), *see* Gymnosporangium globosum from [Juniperus virginiana]. [Thaxter]
- RANUNCULUS abortivus L. (Puccinia eatoniae Arth.), *see* Aecidium ranunculi Schw. from Ranunculus abortivus L. [Arthur]
- RHAMNUS lanceolata (Puccinia coronata Corda on Avena sativa, Phalaris caroliniana, Arrhenatherum elatius), *see* Puccinia coronata Corda aecidiospores from Rhamnus lanceolata. [Carleton]

- RIBES cynosbati L. (*Aecidium albiperidia* Arth), *see* *Puccinia albiperidia* Arth. from *Ribes cynosbati* L. [Arthur]
- RIBES cynosbati L. (spermogonia and aecidia), *see* *Puccinia albiperidia* Arth. teleutospores from *Carex gracillima* Schw. [Arthur]
- ROESTELIA aurantiaca on *Amelanchier canadensis* and *Pyrus malus* (spermogonia), *see* *Gymnosporangium clavipes* from [Juniperus virginiana]. [Thaxter]
- ROESTELIA botryapites on *Amelanchier canadensis*, *see* *Gymnosporangium biseptatum* from [Cupressus thyoides]. [Thaxter]
- ROESTELIA botryapites Schw. on *Amelanchier* [canadensis] and *A. botryapium*, *see* *Gymnosporangium clavariaeforme* DC. from *Juniperus communis*. [Halsted]
- ROESTELIA cornuta on *Amelanchier canadensis* and *Pyrus malus* (spermogonia only), *see* *Gymnosporangium conicum* from [Juniperus virginiana]. [Thaxter]
- ROESTELIA globosum, *see* *Roestelia* "lacerata z" [Thaxter]
- ROESTELIA lacerata on *Crataegus tomentosus*, *see* *Gymnosporangium clavariaeforme* from [Juniperus communis]. [Thaxter]
- ROESTELIA "lacerata z" [R. globosum Thax. as later used] on *Pyrus malus*, *Pyrus americana*, and *Crataegus crus-galli*, *see* *Gymnosporangium globosum* from *Juniperus* [virginiana]. [Thaxter]
- ROESTELIA nidus-avis on *Cydonia* (quince) and *Amelanchier canadensis*, *see* *Gymnosporangium nidus-avis* Thax. nov. sp. from *Juniperus virginiana*. [Thaxter]
- ROESTELIA [penicillata] on *Pirus coronaria*, *see* *Gymnosporangium macropus* from *Juniperus virginiana*. [Halsted]
- ROESTELIA pirata on *Pirus malus* cult., *see* *Gymnosporangium macropus* from *Juniperus virginiana*. [Stewart & Carver]
- ROESTELIA pyrata on *Pyrus iowensis*, *see* *Gymnosporangium macropus* from *Juniperus virginiana*. [Pammel]
- ROESTELIA pyrata on *Pyrus malus*, *see* *Gymnosporangium macropus* from [Juniperus virginiana]. [Thaxter]
- ROESTELIA transformans (?) on *Pyrus arbutifolia* and (?) *Amelanchier canadensis*, *see* *Gymnosporangium ellisii* from [Cupressus sp.]. [Thaxter]
- ROESTELIA sp.? (spermogonia only) on *Crataegus coccinea*, *Pyrus americana*, and *Pyrus malus*, *see* *Gymnosporangium globosum* from [Juniperus virginiana].]Thaxter[

ROSA (hardy garden rose) ([*Phragmidium speciosum* Fr.] spermogonia on *Rosa humilis*), *see* *Phragmidium speciosum* Fr. from *Rosa* (hardy garden rose). [Arthur]

ROSA *humilis* ([*Phragmidium speciosum* Fr.] spermogona), *see* *Phragmidium speciosum* Fr. from *Rosa* (hardy garden rose). [Arthur]

ROSA [Tea rose, Kaiserin Augusta Victoria] (*Caeoma miniata* Am. Auct.), *see* *Phragmidium speciosum* Fr. from *Rosa* sp. [Arthur]

ROSA sp. (*Caeoma miniata* Am. Auct. on *Rosa* [Tea rose, Kaiserin Augusta Victoria]), *see* *Phragmidium speciosum* Fr. from *Rosa* sp. [Arthur]

RUBUS *villosus*, *see* *Rubus occidentalis* and *R. villosus*. [Clinton]

RUBUS *occidentalis* and *R. villosus* (*Gymnoconia interstitialis*, teleutospores [*Puccinia peckiana* Howe]), *see* *Gymnoconia interstitialis* (*Caeoma nitens* Schw.) from *Rubus occidentalis* and *R. villosus*. [Clinton]

RUBUS *occidentalis* and *R. villosus* (*Gymnoconia interstitialis* teleuto [*Puccinia peckiana* Howe] on *Rubus occidentalis* and *R. villosus*), *see* *Gymnoconia interstitialis* (*Caeoma nitens* Schw.) from *Rubus occidentalis* and *R. villosus*. [Clinton]

RUELLIA *strepens* (aecidia, uredo and teleuto on *Ruellia strepens*), *see* *Puccinia lateripes* B. & Rav. teleutospores from *Ruellia strepens*. [Kellerman]

RUELLIA *strepens* (aecidia, uredo and teleuto), *see* *Puccinia lateripes* B. & Rav. teleutospores from *Ruellia strepens*. [Kellerman]

RUELLIA *strepens* (uredo and teleuto on *Ruellia strepens*), *see* *Puccinia lateripes* B. & Rav. aecidiospores from *Ruellia strepens*. [Kellerman]

RUELLIA *strepens* (uredo and teleuto), *see* *Puccinia lateripes* B. & Rav. aecidiospores from *Ruellia strepens*. [Kellerman]

RUMEX *altissimus* (aecidia [*Aecidium rubellum* Pers.]), *see* *Puccinia phragmitis* (Schum.) Körn. from *Phragmitis phragmitis*. [Bates]

RUMEX *crispus* (*Aecidium rubellum* Pers.), *see* *Puccinia phragmites* (Schum.) Körn. from *Phragmites communis*. [Arthur]

RUMEX *obtusifolius* (*Aecidium rubellum* Pers.), *see* *Puccinia phragmitis* (Schum.) Körn. from *Phragmites communis*. [Arthur]

RYE, *see* *Secalis cereale*.

- SALVIA lanceolata Willd. (Puccinia caulicola Tr. & Gall. aecidia [Aecidium caulicolum Kellerm.]). [Kellerman]
- SALVIA lanceolata Willd. (Puccinia caulicola Tr. & Gall. aecidia [Aecidium caulicolum Kellerm.] on Salvia lanceolata Willd.), *see* Puccinia caulicola Tr. & Gall. from Salvia lanceolata Willd. [Kellerman]
- SALVIA lanceolata Willd. (spermogonia and aecidia), *see* Puccinia caulicola Tr. & Gall. teleutospores from Salvia lanceolata. [Arthur]
- SALVIA lanceolata Willd. (spermogonia and aecidia on Salvia lanceolata), *see* Puccinia caulicola Tr. & Gall. teleutospores from Salvia lanceolata. [Arthur]
- SAMBUCUS canadensis (Aecidium sambuci Schw.), *see* Puccinia atkinsoniana Diet. from Carex lurida. [Kellerman]
- SAMBUCUS canadensis (Aecidium sambuci Schw. ?), *see* Puccinia bolleyana Sacc. from Carex trichocarpa. [Arthur]
- SAMBUCUS canadensis (Aecidium sambuci Schw.), *see* Puccinia bolleyana Sacc. from Carex trichocarpa. [Kellerman]
- SAMBUCUS canadensis (Puccinia bolleyana Sacc. uredo on Carex trichocarpa), *see* Puccinia bolleyana Sacc. aecidiospores (Aecidium sambuci Schw.?) from Sambucus canadensis. [Stuart]
- SAMBUCUS canadensis (Puccinia sambuci (Schw.) Arth. aecidia [Aecidium sambuci (Schw.) Arth. (P. atkinsoniana Diet.)] from Carex lurida Wahl. [Arthur]
- SAMBUCUS canadensis (Puccinia sambuci (Schw.) Arth. [P. bolleyana Sacc.] uredo on Carex trichocarpa), *see* Puccinia sambuci (Schw.) Arth. aecidiospores (Aecidium sambuci Schw.) from Sambucus canadensis. [Arthur]
- SAMBUCUS canadensis (Puccinia sambuci (Schw.) Arth. aecidia [Aecidium sambuci Schw.]), *see* Puccinia sambuci (Schw.) Arth. (P. bolleyana Sacc.) from Carex trichocarpa Muhl. [Arthur]
- SCIRPUS atrovirens (Aecidium lycopi Ger. on Lycopus americanus), *see* Puccinia angustata Pk. from Scirpus atrovirens. [Arthur]
- SCIRPUS atrovirens Muhl. (Puccinia angustata Pk. aecidia [Aecidium lycopi Ger.] on Lycopus americanus Muhl.), *see* Puccinia angustata Pk. from Scirpus atrovirens. [Kellerman]
- SCIRPUS atrovirens (Puccinia angustata Pk. uredo), *see* Puccinia angustata Pk. aecidiospores [Aecidium lycopi Ger.] from Lycopus americanus. [Arthur]

SECALIS cereale (Puccinia rubigo-vera secalis on Secalis cereale), *see* Puccinia rubigo-vera secalis uredospores from Secalis cereale. [Carleton]

SECALIS cereale (Puccinia rubigo-vera secalis), *see* Puccinia rubigo-vera secalis uredospores from Secalis cereale. [Carleton]

SMILAX herbacea L. (Aecidium smilacis Schw.), *see* Puccinia amphigena Diet. from Calamovilfa longifolia (Hook.) Hack. [Arthur]

SMILAX hispida Muhl. (Aecidium smilacis Schw.), *see* Puccinia amphigena Diet. from Calamovilfa longifolia (Hook.) Hack. [Arthur]

SMILAX hispida Muhl. (spermogonia and aecidia), *see* Puccinia amphigena Diet. teleutospores from Calamovilfa longifolia (Hook.) Hack. [Arthur]

SOLIDAGO caesia L. (spermogonia) (Aecidium solidaginis Schw.), *see* Puccinia caricis-solidaginis Arth. from Carex jamesii Schw. [Arthur]

SOLIDAGO caesia L. (spermogonia and aecidia), *see* Uromyces caricis-solidaginis Arthur teleutospores from Carex varia Muhl. [Arthur]

SOLIDAGO canadensis L. (Aecidium solidaginis Schw.), *see* Puccinia caricis-solidaginis Arth. from Carex jamesii Schw. [Arthur]

SOLIDAGO canadensis L. (Aecidium solidaginis Schw.), *see* Puccinia caricis-solidaginis Arthur from Carex stipata. [Arthur]

SOLIDAGO canadensis L. (Puccinia caricis-solidaginis Arth. aecidia), *see* Puccinia caricis-solidaginis Arth. from Carex stipata Muhl. [Kellerman]

SOLIDAGO canadensis L. (spermogonia and aecidia), *see* Uromyces caricis-solidaginis Arth. teleutospores from Carex varia Muhl. [Arthur]

SOLIDAGO flexicaulis L. (spermogonia and aecidia), *see* Uromyces caricis-solidaginis Arth. teleutospores from Carex varia Muhl. [Arthur]

SOLIDAGO rigida L. (spermogonia) (Aecidium solidaginis Schw.), *see* Puccinia caricis-solidaginis Arth. from Carex jamesii Schw. [Arthur]

SOLIDAGO serotina Ait. (Aecidium solidaginis Schw.), *see* Puccinia caricis-solidaginis Arth. from Carex jamesii Schw. [Arthur]

- SOLIDAGO serotina (Aecidium solidaginis Schw.), *see* Puccinia caricis-solidaginis Arthur from Carex stipata. [Arthur]
- SOLIDAGO serotina Ait. (spermogonia and aecidia), *see* Uromyces solidagini-caricis Arth. teleutospores from Carex varia Muhl. [Arthur]
- SOLIDAGO ulmifolia Muhl. (spermogonia) (Aecidium solidaginis Schw.), *see* Puccinia caricis-solidaginis Arth. from Carex jamesii Schw. [Arthur]
- SPARTINA cynosuroides (Aecidium fraxini Schw. on Fraxinus viridis), *see* Puccinia peridermiospora (E. & T. Arth. from Spartina cynosuroides. [Arthur]
- SPIRAEA lobata, *see* Ulmaria rubra.
- SPOROBOLUS longifolius (Torr.) Wood (Puccinia vilfae A. & H. aecidia [Aecidium verbenicola K. & S.] on Verbena stricta Vent. and V. urticifolia L.), *see* Puccinia vilfae A. & H. [P. verbenicola (K. & S.) Arth.] from Sporobolus longifolus (Torr.) Wood. [Arthur]
- SPOROBOLUS longifolius (Puccinia vilfae A. & H. uredo), *see* Puccinia vilfae A. & H. aecidiospores (Aecidium verbenicola K. & S.), from Verbena stricta. [Arthur]
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- STROPHOSTYLES helvola (L.) Britt. (Phaseolus diversifolius Pers. (spermogonia and aecidia on Strophostyles helvola), *see* Uromyces phaseoli (Pers.) Wint. teleutospores from Strophostyles helvola (L.) Britt. [Arthur]
- STROPHOSTYLES helvola (L.) Britt. (spermogonia and aecidia), *see* Uromyces phaseoli (Pers.) Wint. teleutospores from Strophostyles helvola (L.) Britt. [Arthur]
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- TRICUSPIS seslerioides (*Aecidium pteleae* on *Ptelea trifoliata*), *see* *Puccinia windsoriae* Schw. from *Tricuspis seslerioides*. [Kellerman]
- TRICUSPIS seslerioides Torr. (*Triodia cuprea* Jacq.) (*Puccinia windsoriae* Schw. aecidia [*Aecidium pteleae* B. & C.?] on *Ptelea trifoliata* L., *see* *Puccinia windsoriae* Schw. from *Tricuspis seslerioides* Torr. (*Triodia cuprea* Jacq.) [Arthur]
- TRIFOLIUM pratense and *T. repens* uredo (*Uromyces trifolii* (A. & S.) Wint.), *see* *Uromyces trifolii* (A. & S.) aecidiospores from *Trifolium pratense* and *T. repens*. [Howell]
- TRIFOLIUM pratense and *T. repens* (*Uromyces trifolii* (A. & S.) Wint. uredo on *Trifolium pratense* and *T. repens*), *see* *Uromyces trifolii* (A. & S.) Wint. aecidiospores from *Trifolium pratense* and *T. repens*. [Howell]
- TRIFOLIUM pratense and *T. repens* (*Uromyces trifolii* (A. & S.) Wint. uredo on *Trifolium pratense* and *T. repens*), *see* *Uromyces trifolii* (A. & S.) Wint. uredospores from *Trifolium pratense* and *T. repens*. [Howell]
- TRIFOLIUM pratense and *T. repens* (*Uromyces trifolii* (A. & S.) Wint. uredo), *see* *Uromyces trifolii* (A. & S.) Wint. uredospores from *Trifolium pratense* and *T. repens*. [Howell]
- TRIFOLIUM repens, *see* *Trifolium pratense* and *T. repens*. [Howell]
- TRIODIA cuprea (*Sieglingia seslerioides* Sc) (*Puccinia windsoriae* Schw. uredo), *see* *Puccinia windsoriae* Schw. aecidiospores (*Aecidium pteleae* B. & C.) from *Ptelea trifoliata*. [Arthur]
- TRIPHragMIUM ulmariae (Schum.) Lk. aecidiospores (*Caeoma ulmariae* Thüm.) from *Ulmaria rubra* (*Spiraea lobata*) (*Triphragmium ulmariae* (Schum.) Lk. uredo and teleuto on *Ulmaria rubra*). J. C. Arthur. Bot. Gaz. 29:272. April 1900.
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- TRIPHragMIUM ulmariae (Schum.) Lk. uredospores from *Ulmaria rubra* (*Spiraea lobata*) (*Triphragmium ulmariae* (Schum.) Lk. uredo on *Ulmaria rubra*). J. C. Arthur. Bot. Gaz. 29:272. April 1900.
- TRIPHragMIUM ulmariae (Schum.) Lk. uredo on *Ulmaria rubra*, *see* *Triphragmium ulmariae* (Schum.) Lk. uredospores from *Ulmaria rubra* (*Spiraea lobata*). [Arthur]

TRITICUM monococcum (*Puccinia graminis tritici*), *see* *Puccinia graminis tritici* uredospores from *Triticum vulgare*. [Carleton]

TRITICUM vulgare (*Puccinia graminis* on *Avena sativa*), *see* *Puccinia graminis* uredospores from *Triticum vulgare*. [Hitchcock & Carleton]

TRITICUM vulgare (*Puccinia graminis* on *Hordeum distichum*), *see* *Puccinia graminis* uredospores from *Triticum vulgare*. [Hitchcock & Carleton]

TRITICUM vulgare (*Puccinia graminis*), *see* *Puccinia graminis* uredospores from *Triticum vulgare*. [Hitchcock & Carleton]

TRITICUM vulgare (*Puccinia graminis* on *Triticum vulgare*), *see* *Puccinia graminis* uredospores from *Triticum vulgare*. [Hitchcock & Carleton]

TRITICUM vulgare (*Puccinia graminis tritici*), *see* *Puccinia graminis tritici* uredospores from *Elymus canadensis glaucifolius*. [Carleton]

TRITICUM vulgare (*Puccinia graminis tritici*), *see* *Puccinia graminis tritici* uredospores from *Hordeum jubatum*. [Carleton]

TRITICUM vulgare (*Puccinia graminis tritici*), *see* *Puccinia graminis tritici* uredospores from *Triticum vulgare*. [Carleton]

TRITICUM vulgare (*Puccinia graminis tritici* on *Triticum vulgare*, *Festuca gigantea*, *Agropyron richardsoni*, *Triticum monococcum*, *Hordeum* [distichum], *Koeleria cristata*), *see* *Puccinia graminis tritici* uredospores from *Triticum vulgare*. [Carleton]

TRITICUM vulgare Vill. (*Uredo rubigo-vera* DC. on *Triticum vulgare*), *see* *Uredo rubigo-vera* DC. from *Triticum vulgare* Vill. [Arthur]

TRITICUM vulgare (*Uredo rubigo-vera* DC.), *see* *Uredo rubigo-vera* DC. from *Triticum vulgare* Vill. [Arthur]

TRITICUM vulgare (*Puccinia rubigo-vera* on *Triticum vulgare*), *see* *Puccinia rubigo-vera* uredospores from *Triticum vulgare*. [Hitchcock & Carleton]

TRITICUM vulgare (*Puccinia rubigo-vera tritici*), *see* *Puccinia rubigo-vera tritici* uredospores from *Triticum vulgare*. [Carleton]

TRITICUM vulgare (*Puccinia rubigo-vera tritici* on *Triticum vulgare*), *see* *Puccinia rubigo-vera tritici* uredospores from *Triticum vulgare*. [Carleton]

- ULMARIA rubra (Triphragmium ulmariae (Schum.) Lk. uredo and teleuto), *see* Triphragmium ulmariae (Schum.) Lk. aecidiospores [Caeoma ulmariae Thüm] from Ulmaria rubra (Spiraea lobata). [Arthur]
- ULMARIA rubra [Spiraea lobata] (Triphragmium ulmariae (Schum.) Lk. uredo on Ulmaria rubra), *see* Triphragmium ulmariae (Schum.) Lk. uredospores from Ulmaria rubra (Spiraea lobata). [Arthur]
- ULMARIA rubra [Spiraea lobata] (Triphragmium ulmariae (Schum.) Lk. uredo and teleuto on Ulmaria rubra), *see* Triphragmium ulmariae (Schum.) Lk. aecidiospores [Caeoma ulmariae Thüm.] from Ulmaria rubra (Spiraea lobata).
- ULMARIA rubra [Spiraea lobata] (Triphragmium ulmariae (Schum.) Lk. uredo, *see* Triphragmium ulmariae (Schum.) Lk. uredospores from Ulmaria rubra (Spiraea lobata). [Arthur]
- UREDOn Euphorbia nutans, *see* Uromyces euphorbia C. & P. aecidiospores from Euphorbia nutans. [Arthur]
- UREDOn rubigo-vera DC. on Triticum vulgare, *see* Uredo rubigo-vera DC. from Triticum vulgare Vill. [Arthur]
- UREDOn rubigo-vera DC. from Triticum vulgare Vill. (Uredo rubigo-vera DC. on Triticum vulgare). J. C. Arthur. Bot. Gaz, 35:13. Jan. 1903.
- UROMYCES aristidae E. & E. from Aristida oligantha Mx. (Aecidium plantaginis Ces. (?) on Plantago rugelii). J. C. Arthur. Bot. Gaz. 35:17. Jan. 1903.
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- UROMYCES euphorbiae C. & P. uredo on Euphorbia dentata Mx., *see* Uromyces euphorbiae C. & P. uredospores from Euphorbia dentata Mx. [Arthur]

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- UROMYCES euphorbiae C. & P. uredo on Euphorbia humistrata Englm., *see* Uromyces euphorbiae C. & P. aecidiospores from Euphorbia humistrata Englm. [Arthur]
- UROMYCES euphorbiae C. & P. uredo on Euphorbia nutans Lag., *see* Uromyces euphorbiae C. & P. aecidiospores from Euphorbia nutans Lag. [Arthur]
- UROMYCES euphorbiae C. & P. uredo and teleuto on Euphorbia nutans, *see* Uromyces euphorbiae (Aecidium euphorbiae Am. Auct. from Euphorbia nutans). [Arthur]
- UROMYCES lespedezae-procumbentis (Schw.) Curt. teleutospores from Lespedeza capitata Mx. (spermogonia and aecidia [Aecidium leucospermum B. & C.] on Lespedeza capitata). J. C. Arthur. Jour. Mycol. 10:14. Jan. 1904.
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- UROMYCES solidagini-caricis Arth. n. n. teleutospores from Carex varia Muhl. (spermogonia and aecidia on Solidago canadensis L., S. serotina Ait., S. flexicaulis L., S. caesia L.) J. C. Arthur. Jour. Mycol. 10:16. Jan. 1904.
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- UROMYCES trifolii (A. & S.) Wint. uredo on Trifolium pratense and T. repens, *see* Uromyces trifolii (A. & S.) Wint. uredospores from Trifolium pratense and T. repens. [Howell]
- UROMYCES trifolii (A. & S.) Wint. aecidiospores from Trifolium pratense and T. repens (Uromyces trifolii (A. & S.) Wint. uredo on Trifolium pratense and T. repens). J. K. Howell. Cornell Univ. Agr. Exp. Sta. Bull. 24:137. Dec. 1890.
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- URTICA sp. (Puccinia caricis (Schum.) Reb. uredo on Carex stricta), *see* Puccinia caricis (Schum.) Reb. aecidiospores [Aecidium urticae Schum.] from [Urtica sp.] [Arthur]

- URTICA gracilis (Aecidium urticae Schum.), see Puccinia caricis (Schum.) Reb. from Carex riparia. [Kellerman]
- URTICA gracilis (Aecidium urticae), see Puccinia caricis (Schum.) Reb. from Carex stricta. [Arthur]
- URTICA gracilis (Aecidium urticae Schw.), see Puccinia caricis (Schum.) Reb. from Carex stricta. [Kellerman]
- URTICA gracilis (Puccinia caricis (Schum.) Reb. aecidia), see Puccinia caricis (Schum.) Reb. from Carex stricta Lam. [Arthur]
- VERBENA stricta Vent. (Puccinia vilfae A. & H. aecidia [Aecidium verbenicola K. & S.]), see Puccinia vilfae A. & H. [P. verbenicola (K. & S.) Arth. n. n.] from Sporobolus longifolius (Torr.) Wood. [Arthur]
- VERBENA stricta (Puccinia vilfae A. & H. uredo on Sporobolus longifolius), see Puccinia vilfae A. & H. aecidiospores (Aecidium verbenicola K. & S.) from Verbena stricta. [Arthur]
- VERBENA urticifolia L. (Puccinia vilfae A. & H. aecidia [Aecidium verbenicola K. & S.]), see Puccinia vilfae A. & H. [P. verbenicola (K. & S.) Arth.] from Sporobolus longifolius (Torr.) Wood. [Arthur]
- WASHINGTONIA claytoni (Puccinia osmorrhizae teleuto [?]), see Aecidium osmorrhizae Pk. from Washingtonia claytoni. [Kellerman]
- WASHINGTONIA claytoni (Osmorrhiza brevistylis) [Puccinia osmorrhizae teleuto] on Chaerophyllum procumbens and (?) on Washingtonia claytoni), see Aecidium osmorrhizae Pk. from Washingtonia claytoni. [Kellerman]
- Wheat, see Triticum vulgare.

SUMMARY OF ALTERNATE FORMS.

- Aecidium albiperidia Arth.—Puccinia albiperidia Arth.
- Aecidium asteratum Schw.—Puccinia caricis-asteris Arth.
- Aecidium berberidis Pers.—Puccinia poculiformis (Jacq.) Wettst.
- Aecidium calystegiae Desm.—Puccinia convolvuli Cast.
- Aecidium caulicolum Kellerm.—Puccinia caulicola Tr. & Gall.
- Aecidium cirsii-lanceolati Schroet.—Aecidium cirsii-lanceolati Kellerm.

- Aecidium ellisii* Tr. & Gall.—*Puccinia subnitens* Diet.
- Aecidium erigeronatum* Schw.—*Puccinia caricis-erigerontis* Arth.
- Aecidium euphorbiae* Am. Auct.—*Uromyces euphorbiae* C. & P.
- Aecidium fraxini* Schw.—*Puccinia fraxinata* (Lk.) Arth.
- Aecidium* on *Helianthus*—*Puccinia helianthi* Schw.
- Aecidium hibisci* Schw.—*Puccinia hibisciata* (Schw.) Kellerm. (*P. muhlenbergiae* Arth. & Holw.)
- Aecidium hynoideum* B. & C.—*Puccinia hydnoidea* (B. & C.) Arth.
- Aecidium impatientis* Schw.—*Puccinia impatientis* (Schw.) Arth. (*P. rubigo-vera* Auct. on *Elymus virginicus*)
- Aecidium jamesianum* Pk.—*Puccinia jamesiana* (Pk.) Arth. (*P. bartholomaei* Diet.)
- Aecidium* on *Larix decidua*, *see* *Caeoma* on *Larix decidua*.
- Aecidium lateripes* Kellerm.—*Puccinia lateripes* B. & Rav.
- Aecidium leucospermum* B. & C.—*Uromyces lespedezae-procumbentis* (Schw.) Curt.
- Aecidium lycopi* Ger.—*Puccinia angustata* Pk.
- Aecidium oenotherae* Pk., *see* *Aecidium peckii* DeToni.
- Aecidium pammellii* Trel.—*Puccinia panici* Diet.
- Aecidium peckii* DeToni, (*Ae. oenotherae* Pk.)—*Puccinia peckii* (DeToni) Kellerm. (*P. caricis* Auct. p. p.)
- Aecidium pentstemonis* Schw.—*Puccinia andropogonis* Schw.
- Aecidium plantaginis* Ces. (?) on *Plantago rugelii* Dec.—*Uromyces aristidae* E. & E.
- Aecidium pteleae* B. & C.—*Puccinia windsoriae* Schw.
- Aecidium pustulatum* Curt.—*Puccinia pustulata* (Curt.) Arth.
- Aecidium* [ranunculacearum (?)] on *Anemone canadensis* L.—*Puccinia simillima* Arth.
- Aecidium ranunculi* Schw.—*Puccinia eatoniae* Arth.
- Aecidium rhamni* Pers.—*Puccinia rhamni* (Pers.) Wettst. (*P. coronata* Corda.)
- Aecidium rubellum* Pers.—*Puccinia phragmitis* Schum.
- Aecidium sambuci* Schw.—*Puccinia sambuci* (Schw.) Arth. (*P. atkinsoniana* Diet., *P. bolleyana* Sacc.)
- Aecidium smilacis* Schw.—*Puccinia amphigena* Diet.
- Aecidium solidaginis* Schw.—*Puccinia caricis-solidaginis* Arth.

- Aecidium* on *Solidago*—*Uromyces solidagini-caricis* Arth.
Aecidium on *Strophostyles helvola*—*Uromyces phaseoli* (Pers.) Wint.
Aecidium on *Trifolium*, *see* *Uromyces trifolii* (A. & S.) Wint.
Aecidium urticae Schum.—*Puccinia caricis* (Schum.) Reb.
Aecidium verbenicola K. & S.—*Puccinia vilfae* A. & H.
Caeoma (*Aecidium*) *erigeronatum* Schw., *see* *Aecidium erigeronatum* Schw.
Caeoma (*Aecidium*) *hibisci* Schw., *see* *Puccinia hibisciata* Schw.) Kellerm.
Caeoma on *Larix decidua*—*Melampsora medusae* Thüm. [*M. populina* Am. Auct.]
Caeoma miniata Am. Auct.—*Phragmidium speciosum* Fr.
Caeoma nitens Schw., *see* *Gymnoconia interstitialis* (Schlecht.) Lagh.
Caeoma ulmariae Thüm.—*Triphragmium ulmariae* (Schum.) Lk.
Gymnoconia interstitialis (Schlecht.) Lagh., *aecidium* (*Caeoma nitens* Schw.), and *teleuto* (*Puccinia peckinana* Howe); autoecious.
Gymnosporangium biseptatum Ell.—*Roestelia botryapites* Schw.
Gymnosporangium clavariaeforme (Jacq.) Rees.—*Roestelia lacerata* (Sow.) Fr.
Gymnosporangium clavipes Cke. & Pk.—*Roestelia aurantiaca* Peck.
Gymnosporangium conicum Rees.—*Roestelia cornuta* (Ehr.) Fr.
Gymnosporangium ellisii (Berk.) Farl.—*Roestelia transformans* Ellis (?)
Gymnosporangium globosum Farl.—*Roestelia globosum* ("lacerata z") Thaxter.
Gymnosporangium macropus Lk.—*Roestelia pyrata* Thaxter.
Gymnosporangium nidus-avis Thaxter—*Roestelia nidus-avis* Thaxter.
Melampsora medusae Thüm [*M. populina* Am Auct.]—*Caeoma* on *Larix decidua*.
Melampsora populina Am. Auct., *see* *Melampsora medusae* Thüm.
Phragmidium speciosum Fr.—*Caeoma miniata* Am. Auct.
Puccinia albiperidia Arth., *aecidium* [*albiperidium* Arth.] *uredo* and *teleuto*; autoecious.

- Puccinia americana* Lagh., *see* *Puccinia andropogonis* Schw.
Puccinia amphigena Diet.—*Aecidium smilacis* Schw.
Puccinia andropogonis Schw. (*P. americana* Lagh.)—*Aecidium pentstemonis* Schw.
Puccinia angustata Pk.—*Aecidium lycopi* Ger.
Puccinia atkinsoniana Diet., *see* *Puccinia sambuci* (Schw.) Arth.
Puccinia bartholomaei Diet., *see* *Puccinia jamesiana* (Pk.) Arth.
Puccinia bolleyana Sacc., *see* *Puccinia sambuci* (Schw.) Arth.
Puccinia caricis (Schum.) Reb.—*Aecidium urticae* Schum.
Puccinia caricis Am Auct. p. p. (*P. peckii* [DeToni] Kellerm.), *see* *P. peckii* (DeToni) Kellerm.
Puccinia caricis-asteris Arth.—*Aecidium asteratum* Schw.
Puccinia caricis-erigerontis Arth.—*Aecidium erigeronatum* Schw.
Puccinia caricis-solidaginis Arth.—*Aecidium solidaginis* Schw.
Puccinia caulicola Tr. & Gall., *aecidium* [*caulicolum* Kellerm.], *uredo* and *teleuto*; *autoecious*.
Puccinia cirsii-lanceolati Schroet., *aecidium* [*cirsii-lanceolati* Kellerm.] *uredo* and *teleuto*; *autoecious*.
Puccinia convolvuli Cast., *aecidium* [*calystegiae* Desm.] *uredo* and *teleuto*; *autoecious*.
Puccinia coronata Corda, *see* *Puccinia rhamni* (Pers.) Wettst.
Puccinia eatoniae Arth.—*Aecidium ranunculi* Schw.
Puccinia fraxinata (Lk.) Arth.—*Aecidium fraxini* Schw.
Puccinia graminis, *see* *Puccinia poculiformis* (Jacq.) Wettst.
Puccinia helianthi Schw., *aecidium* [*Caecoma helianthi* Schw.], *uredo* and *teleuto*; *autoecious*.
Puccinia hibisciata (Schw.) Kellerm. (*P. muhlenbergiae* Arth. & Hol.)—*Aecidium hibisciatum* Schw.
Puccinia hydnoidea (B. & C.) Arth.—*Aecidium hydnoideum* B. & C.
Puccinia impatientis (Schw.) Arth. (*P. rubigo-vera* Auct. on *Elymus virginicus*)—*Aecidium impatientis* Schw.
Puccinia jamesiana (Pk.) Arth. (*P. bartholomaei* Diet.)—*Aecidium jamesianum* Pk.
Puccinia lateripes B. & Rav., *aecidium* [*lateripes* Kellerm.] *uredo* and *teleutospores*; *autoecious*.
Puccinia muhlenbergiae Arth. & Hol., *see* *Puccinia hibisciata* (Schw.) Kellerm.

- Puccinia panici* Diet.—*Aecidium pammellii* Trel.
Puccinia peckiana Howe, *see* *Gymnoconia interstitialis* (Schlecht.) Lagh.
Puccinia peckii (DeToni) Kellerm. (*P. caricis* Am. Auct. p. p.)
—*Aecidium peckii* DeToni (*Ae. oenotherae* Pk.).
Puccinia peridermiospora (E. & T.) Arth., *see* *Puccinia fraxinata* (Lk.) Arth.
Puccinia phragmitis (Schum.) Körn.—*Aecidium rubellum* Pers.
Puccinia poculiformis (Jacq.) Wettst.—*Aecidium berberidis* Pers.
Puccinia pustulata (Curt.) Arth.—*Aecidium pustulatum* Curt.
Puccinia rhamni (Pers.) Wettst. (*P. coronata* Corda)—*Aecidium rhamni* Pers.
Puccinia rubigo-vera Am. Auct, on *Elymus virginicus*, *see* *Puccinia impatientis* (Schw.) Arth.
Puccinia sambuci (Schw.) Arth. (*P. atkinsoniana* Diet., *P. bolleyana* Sacc.)—*Aecidium sambuci* (Schw.) Arth.
Puccinia simillima Arth.—*Aecidium ranunculacearum* (?) on *Anemone canadensis* L.
Puccinia subnitens Diet.—*Aecidium ellisii* Tr. & Gall.
Puccinia vilfae A. & H.—*Aecidium verbenicola* K. & S.
Puccinia windsoriae Schw.—*Aecidium pteleae* B. & C.
Roestelia aurantiaca Pk.—*Gymnosporangium clavipes* Cke. & Pk.
Roestelia botryapites Schw.—*Gymnosporangium biseptatum* Ell.
Roestelia cornuta (Ehr.) Fr.—*Gymnosporangium concium* Rees.
Roestelia globosum ("lacerata z") Thaxter—*Gymnosporangium globosum* Farl.
Roestelia lacerata (Sow.) Fr.—*Gymnosporangium clavariaeforme* (Jacq.) Rees.
Roestelia "lacerata z," *see* *Roestelia globosum*.
Roestelia nidus-avis Thax.—*Gymnosporangium nidus-avis* Thax.
Roestelia pyrata Thaxter—*Gymnosporangium macropus* Lk.
Roestelia transformans Ell. (?) —*Gymnosporangium ellisii* (Berk.) Farl.
Triphragmium ulmariae (Schum.) Lk.—*Caeoma ulmariae* Thüm.
Uromyces aristidae E. & E.—*Aecidium plantaginis* Ces. (?) on *Plantago rugelli* Dec.
Uromyces solidagini-caricis Arth.—*Aecidium* on *Solidago*.

Uromyces euphorbiae C. & P.—*Aecidium euphorbiae* Am. Auct.

Uromyces lespedezae-procumbentis (Schw.) Curt., *aecidium* [leucospermum B. & C.], uredo and teleuto; autoecious.

Uromyces phaseoli (Pers.) Wint., *aecidium*, uredo and teleuto; autoecious.

Uromyces trifolii (A. & S.) Wint. *aecidium*, uredo and teleuto; autoecious.

NOTES FROM MYCOLOGICAL LITERATURE. IX.

W. A. KELLERMAN.

THE FIRST PART OF A KEY TO THE NORTH AMERICAN SPECIES OF INOCYBE — Sections Squarrosae and Lacerae, — is given by F. S. Earle in *Torrey*, 3:168-170, Nov. 1903.

THE FORM AND STRUCTURE OF THE MYCODOMATIA of *Myrica cerifera* L., is published in the Proceedings of the Academy of Natural Sciences of Philadelphia, 55:352-362, Pl. XVI-XVII, 1903, by John W. Harshberger. This is a new host for *Frankia brunchorstii* Möller; the author describes his investigations and observations, and says it is probable that this species "is more in the nature of an endotrophic mycorrhiza, to be placed intermediate between the ectotrophic mycorrhiza found on the Indian Pipe *Monotropa*, and the typical endotrophic mycorrhiza found in *Thismia* and certain other plants, where a definite relationship is established between the nucleus of the host and the fungous hyphae." A chronological Bibliographical Index of 18 items, concludes the article. The hosts on which *Mycodomatia* have been reported to date are: *Alnus glutinosa*, *A. incana*, *A. serrulata*, *A. undulata*, *Elaeagnus*, *Hippophae rhamnoides*, *Shepherdia*, [*Frankia alni* (Möller) Atks.]; *Myrica gale*, *M. cerifera* [*F. brunchorstii* Möller]; *Ceanothus americanus* [*F. ceanothi* Atks.].

NUCLEAR DIVISIONS AND NUCLEAR FUSION IN *COLEOSPORIUM SONCHI-ARVENSIS* Lév., R. J. Holden and R. A. Harper, *Trans. Wisc. Acad. Sci. Arts and Let.* 14:63-82, Pl. I, II, Sept. 1903 (separate), outlines the study of the nuclear phenomena in the rusts by previous investigators, and details important investigations by the authors which agree in general with previous results. In regard to the life history of the *Coleosporium* the authors say: "From the teleutospore to the sporidium we find uni-nucleated cells; from the sporidium to the teleutospore we have bi-nucleated cells. . . . There is as yet no evidence of any proper cell fusion in the rusts though the fusion of the nuclei in the teleutospore has the essential characteristics of a sexual fertilization in the origin of the nuclei and in the behavior of the teleutospore after fusion as described above. . . . Sexual reproduction in the

rusts may possibly dispense with cell fusion, while retaining the more essential feature of the union of nuclei more or less widely separated in origin."

THE ARTICLES IN THE REVUE MYCOLOGIQUE, October 1903, besides the reviews are as follows: Mycorrhizes des arbres forestiers et sur le sens de la Symbiose des Racines, Georg F. L. Sarauw; L'Amanita mappa Fries est-elle à ranger parmi les espèces très vénéneuses? R. Ferry et H. Schmidt.

IN REVISTA AGRONOMICA, DEZEMBRO DE 1903, J. VERISSIMO D'ALMEIDA ET M. DE SOUZA DA CAMARA, publish contributiones ad Mycofloram Lusitaniae, Centuria III. Four species are listed, and a new genus is proposed, namely, COUTINIA, Sphaeriaceae, a familia Dothideacearum praecipue differt stromate nullo. They also make correction of previous publication as follows: Puccinia maculicola n. sp. in *Urginea Scilla* est P. *Asphodeli* Duby, in *Asphodeli* sp.

ISLANDS SVAMPE AF E. ROSTRUP published in Botanisk Tidskrift, 25:281-335, 1903, contains a list of 543 fungi. The author describes 22 new species: the diagnoses are in the latin language.

IN THE ANNALS OF BOTANY (17:167-236, PL. XII-XIII, JAN. 1903) is published an extended article by T. P. Barker, on The Morphology and Development of the Ascocarp in *Monascus*. "These considerations point to the view that *Monascus* represents a low and comparatively simple type of Ascomycete and is not far removed from a common ancestral type, from which all the higher Ascomyces may be supposed to have sprung."

ALBERT HOWARD, WHOSE INVESTIGATION ON SOME DISEASES OF THE SUGAR-CANE IN THE WEST INDIES is published in the Annals of Botany, 17:373-411, Pl. XVIII, March 1903, concludes that *Thielaviopsis ethacetica* Went. (and not *Melanconium sacchari* Masee) causes a disease of cane-cuttings which is the same as the "pine apple" disease in Java; the 'rind' disease is caused by *Colletotrichum falcatum* Went.; the common root disease of the sugar-cane in Barbados is caused by *Marasmius sacchari* Wakker.

MISS E. DALE CONTRIBUTES AN INTERESTING AND IMPORTANT ARTICLE, OBSERVATIONS ON GYMNOASCACEAE, Annals of Botany, 17:571-596, Pl. XXVII-XXVIII, June 1903. The investigations "leave no doubt as to the occurrence of a sexual process in the Gymnoascaceae, if not in every species, at least in *Gymnoascus reesii* and in *G. candidus*. Such a process has not before been described, though it was assumed."

TWO FUNGI, PARASITIC ON SPECIES OF *TOLYPOTHRIX* (*Reticularia nodosa* Dang. and *R. boodlei* n. sp.) by F. E. Fritsch (Annals of Botany, 17:649-664, Pl. XXIX, Sept. 1903) is an

important contribution to the knowledge of Fungi affecting algal hosts — nearly two hundred species now being known.

N. PATOUILLARD IN A NOTE SUR LE GENRE PAUROCOTYLIS BERK., Bull. Soc. Myc. France, 19:339-341, 31 Dec. 1903, publishes his study of *Paurocotylis pila* of New Zealand and *P. fulva* of Ceylon and concludes as follows: En résumé, *Paurocotylis* est un groupe d'Ascomycètes formé d'éléments hétérogènes, duquel on devra retirer toutes les espèces que ne répondent pas au type du *P. pila*.

SUR L'IDENTITE REELLE DU SPHAEROPSIS MALORUM Peck, by G. Delacroix, Bull. Soc. Myc. France, 19:350-2, 31 Dec. 1903, refers to a previous publication by the same author, then states that he has had an abundance of material for study collected in various countries. He says *Sphaeropsis malorum* is different from both *Diplodia maura* C. & Ell. and *Botryodiplodia mali* P. Braunaud; Enfin le *Sphaeropsis malorum* Peck est absolument identique à *Diplodia pseudo-diplodia* Fuck. Je considere, d'un autre côté, que le *Macrophoma malorum* (Berk.) Berl. et Vogl. n'est autre que le stade jeune du *Sphaeropsis*.

THE ARTICLES IN THE BULLETIN DE LA SOCIETE MYCOLOGIQUE DE FRANCE, tome XIX, 4e Fascicule are as follows: Patouillard, Sur le genre *Paurocotylis* Berk.; Rolland, Note sur l'*Inocybe repanda* Bull. et l'*Inocybe hiulca* Fries; Delacroix, [Travaux Stat. Path. Veg.] Sur le "blanc" des feuilles de Mûries de Madagascar produit par *Ovulariopsis moricola* nov. sp. G. Del., A propos de *Stromatinia linhartiana* Prill. et Del. (*Sclerotinia cydoniae* Schellenberg), Sur l'identité réelle du *Sphaeropsis Malorum* Peck, Sur le parasitisme du *Dothichiza populea* Sacc. et Briard sur diverses espèces de Peupliers, Sur la pourriture des Pommes des terre; Empoisonnement par l'*Amanita muscaria*, par un Pleurote et une Clavaire.

MONOGRAPHIA UREDINEARUM, P. ET H. SYDOW, VOLUMEN I, FASCICULUS IV, appeared 1 November 1903. It includes pp. 593-768 and the serial numbers are 880 to 1094 inclusive. The species of *Puccinia* enumerated are those on the hosts belonging to Orchidaceae, Marantaceae, Cannaceae, Zingiberaceae, Iridaceae, Amaryllidaceae, Haemorrhaceae, Liliaceae, Bromeliaceae, Juncaceae, Cyperaceae, and Graminaceae. It might be noted that the authors do not adhere to strict priority in the use of names of polymorphic species. Thus they do not follow Arthur's name of *Puccinia sambuci* (*Aecidium sambuci* 1834, *P. atkinsoniana* 1897, and *P. bolleyana* 1889) but retain *Puccinia bolleyana* with the others as synonyms; again, *Puccinia hibisciata* (Sch.) Kellerm. (*Aecidium hibisciatum* Schw. 1834, *Puccinia muhlenbergiae* Arth. & Holw. 1902) is listed as *P. muhlenbergiae* Arth. & Holw. with other names as synonyms.

THE "BLUING" AND THE "RED ROT" OF THE WESTERN YELLOW PINE, with special reference to the Black Hills Forest Reserve, Hermann von Schrenk, a paper of 40 pages and 14 plates, forms Bulletin No. 36 of the Bureau of Plant Industry, issued 5 May 1903. Dr. von Schrenk finds the causes of the two phenomena to be fungi respectively as follows: *Ceratostomella pilifera* (Fr.) Winter, and *Polyporus* [Fomes] *ponderosus* von Schrenk n. sp. Later publication is promised.

R. E. B. MCKENNEY REPORTS IN BULLETIN No. 51, Bureau of Plant Industry, on the Wilt Disease of Tobacco and its Control, saying microscopic examination of wilted Tobacco always reveals the presence of a fungus belonging to the genus *Fusarium* (Neocosmospora). This is found in the woody parts of the roots and stem. The *Fusarium* is a soil fungus and gains entrance to the plants through the *fine roots*.

OBSERVATIONS ON PHALLUS RAVENELII, BY HOWARD J. BANKER, *Torreyia*, 4:5-8, Jan. 1904, pertains to an abundance of "eggs" from the size of a mustard seed to that of a walnut; also the mycelium in a pile of sawdust, that protected by a pile of lumber being a tangled network and filled with very irregular tubercular masses one-half to five centimeters in diameter. These tubercles or sclerotia appeared to be enlarged portions of the mycelial threads and were twisted, lobed and convoluted in a very irregular manner. The white color of mycelium and tubercles quickly turned bluish-purple on exposure to air.

IN BÖTANISKA NOTISER FÖR ÅR 1903, PP. 249-267, G. LAGERHEIM publishes an interesting article, Zur Kenntniss der *Bulgaria globosa* (Schmid.) Fr. (*Sarcosoma globosum* et *S. platydiscus* Auct.), giving a history of this species, its occurrence and notes on its development. It was named *Burcardia globosa* by Schmidel in 1755; this name being preoccupied it was changed to *Sarcosoma* by Caspary. The author points out the insufficient grounds for maintaining this genus and says: Meines erachtens ist deshalb die Gattung *Sarcosoma* Casp. einzuziehen oder höchstens als ein subgenus der Gattung *Bulgaria* Fr. zu betrachten. A plate accompanies the article.

THE RESULTS OF THESE EXPERIMENTS PROVE that pear blight may attack apricot twigs and fruit—is the reported result in "An Apricot Blight" by Wendell Paddock, Bulletin 84, Colorado Agricultural Experiment Station, October 1903.

R. H. PETTIT, ENTOMOLOGIST, MICHIGAN AGRICULTURAL EXPERIMENT STATION, reports in Special Bulletin No. 17, a fungous disease of the Musquito—*Entomophthora* sp. nov., and a fungous disease of a scale insect (*Lecanium longulum*), namely, *Isaria lecanifera* Pettit n. sp. "No *Isaria* sporophores were seen but the fungus is placed in the genus *Isaria* because

of its very close affinity to the *Isaria* stage of *Cordyceps clavulata*."

CLAVARIA MUCIDA PERS. AS GROWING ON ALGA-COVERED WOOD, said by Morgan "usually growing on a thin greenish stratum, *Chlorococcus*", is noted by W. C. Cooker in the *Botanical Gazette*, 37:62, Jan. 1904. The hyphae do not enter the alga and have no haustoria, but show about the same close relation (says the author) with the alga as in the case of the lichen, *Collema*. He adds: From its constant occurrence and close association with this alga there seems scarcely a doubt that *Clavaria mucida* is in the initial stages of becoming a basidiomycetous lichen.

IN THE BULLETIN OF THE TORREY BOTANICAL CLUB FOR JANUARY 1904, J. C. Arthur publishes *New Species of Uredineae*—III. The article includes two species of *Uromyces*, six species of *Puccinia*, two species of *Ravenelia*, one species of *Uredo*, five species of *Aecidium*; total sixteen species. Two third of the species are Trans-Mississippian and the remainder from Porto Rico. The author calls attention to the fact that with the exception of four species the descriptions are incomplete—including but one or two of the possible three, four or even more spore forms. A new species, *Puccinia sieversiae*, adds one to the very few belonging to this genus occurring upon *Rosaceae*. We note that the much-beridden *Malvas* are loaded with still another *Aecidium* (*Ae. malvicola*)—previously reported and well-distinguished species being *Aecidium tuberculatum* E. & K., *Ae. napaeae* A. & H. (*Ae. callirrhoeae* E. & K.), and *Ae. roestelioides* E. & E.

J. BRESADOLA GIVES NINE NEW SPECIES, ALSO ONE NEW GENUS, under the title *Mycologia Lusitanica, Diagnoses Fungorum novorum*, in *Broteria Revista de Ciencias Naturaes do Collegio de S. Fiel*, 2:87-92, 1903. The new genus is *Hyposcypha*, a genere *Dasyscypha* differt deficientia pili genuini in ascomate.

OBSERVATIONS ON THE CYTOLOGY OF *ARAIOSPORA PULCHRA* Thaxter by Cyrus Ambrose King, forms No. 5 of Vol. 31 of the *Proceedings of the Boston Society of Natural History*, p. 211-245. It is an exhaustive paper accompanied by six heliotype plates. Literature is cited, 40 items, in chronological order from 1881 to 1901. A convenient summary is given covering two pages. The author refers the genus *Araiospora* to the *Peronosporineae*—"but should be placed between *Pythium* and the *Saprolegniaceae*."

IN AN ARTICLE BY FR. BUBAK AND J. E. KABAT, EINIGE NEUE IMPERFECTEN AUS BOEHMEN UND TIROL, *Oesterreichische Botanische Zeitschrift*, 54:22-31, Jan. 1904, nineteen new species

are described. A new genus by Bubák is included of which he says: *Besonderes Interesse verdient die neue Leptostromeceen-Gattung Kabatia von Lonicera xylostreum L. aus Tirol, welche eine schöne Parallelförmigkeit zu Leptothyrium periclymeni (Desm.) Sacc. darstellt. But the spores are two-celled, strongly curved, sickle-form; the genus belongs in the Scolecosporeae.*

DIE WIRTSWECHSELNDEN ROSTPILZE, VERSUCH EINER GESAMTDARSTELLUNG IHRER BIOLOGISCHEN VERHAELTNISSE von H. Klebahn, is a volume of 447 pp. issued in 1904 by Gebrüder Bornträger, Berlin. This is a very important work bringing the extensive literature of this interesting subject together, necessarily incomplete however for the past year. The list of publications cited (articles by each author chronologically arranged) includes an alphabetical list of 286 authors.. The General Part includes such topics as Begriff des Wirtswechsels und Vorkommen desselben, Entwicklungstypen, Spezialisierungserscheinungen, etc. The Special Part outlines the history and results of the various experimenters, species by species, beginning with *Puccinia graminis*. An alphabetical index is given of the heteroecious species with their hosts, an Index of the *Aecidia*, and an Index of host plants.

THE GENUS PUCCINIA IS DISCUSSED WITH REFERENCE TO STABILITY OF NOMENCLATURE by J. C. Arthur in the Proceedings of the Indiana Academy of Science for 1902 (pp. 81-3). The name was used first by Micheli in 1729. Haller used the same previous to 1753 (initial date for priority), and again in 1768 but here not employing binomials. Adanson cites the name in 1763 but does not cite any species — hence the genus is not there established. The next oldest author for this name is Willdenow 1787 — giving the single species *P. simplex*, but the plant referred to was not a Rust; conclusion: perhaps Kuntze's use of *Dicaeoma* is to be followed.

H. W. CONN TELLS BRIEFLY, IN THE FIFTEENTH ANNUAL REPORT OF THE STORRS AGR. EXP. STA. (pp. 92-6), 1903, his results of extended studies on the Bacteria in freshly drawn milk, and points out the wide discrepancy between his work and that of Harrison and Cumming who found 95 per cent of bacteria belonging to the lactic types, whereas Conn detected less than 50 per cent. Reports by the former indicate that the milk ducts furnish bacteria by thousands per cubic centimeter of milk, whereas Conn shows that the uncontaminated milk contains only small numbers. The discrepancies are referred to the use by Harrison and Cumming of *ordinary* gelatin.

KULTURVERSUCHE MIT PAPILIONACEEN BEWOHNENDEN ROSTPILZEN, von Ernst Jordi, Centralbl. Bakt. Par. u. Infek. 2. Ab., 10:777-9, 3 Sept. 1903, extends our knowledge of the bi-

ology of these species, most of the results however simply confirming previous determinations. As Dietel formerly, so here Jordi, found that in case of *Uromyces hedysari-obscuri* aecidiospores may produce aecidia — “es ergiebt sich daraus ferner, dass die Aecidiosporen im stande sind, theils wieder Aecidien, theils direkt Teleutosporenlager zu bilden...”

D. McALPINE GIVES AN ACCOUNT WITH ILLUSTRATIONS OF *OPHIOBOLUS GRAMINIS* SACC. and *Hendersonia graminis* n. sp., parasitic on and destructive to wheat, being the disease known as “Take all and White-heads in Wheat”. The publication is Bulletin No. 9, Department of Agriculture, Victoria. It occurs also in other countries “and has recently been discovered in America. . . . Cordley describes a disease occurring in Oregon U. S. A., which has all the characteristics of this one, although only the fungus mycelium has been found.”

DESCRIPTIO ET ADUMBRATIO MICROSCOPIO-ANALYTICA FUNGORUM is the title of a work, auctore D. Romano Adolpho Hedwigio, that unfortunately yet remains unpublished, sometimes cited [“Hedw. f. Fung. ined.”] by DeCandolle in *Flore Française*, 1805, and the circumstances relating thereto so far as known, are detailed by J. C. Arthur under the title, An interesting unpublished Work on Fungi, *Torreyia*, 4:21-3, Feb. 1904. Hedwig, son of the elder Hedwig in honor of whom the journal *Hedwigia* was named, was professor of Botany at Leipzig, and prepared a work on parasitic fungi “with a true talent” which A. P. DeCandolle undertook (unsuccessfully) to have published in Paris. Dr. Arthur who recently examined the manuscript says: — “It is a pity that so admirable a piece of scientific work should have met such an untoward fate. Even after a hundred years its publication would be a distinct gain to science.”

THE MYCOLOGICAL ARTICLES IN *HEDWIGIA*, BAND XLII, HEFT 6, 1903, are as follows: Hugo Glück, Beiträge zur Flechtenflora Heidelbergs (Schluss); P. Hennings, Ueber einige interessantere deutsche Hutpilze [perhaps a new species], Einige im Berliner Botanischen Garten 1903 gesammelte neue Pilze [17 new species], *Biatorellina* P. Henn, n. gen. *Patellariacearum*, *Squamotubera* P. Henn. n. gen. *Xylariacearum*, Ein stark phosphoreszierender javanischer *Agaricus* (*Mycena illuminans* P. Henn. n. sp.), Ein Sklerotien-Blätterpilz, *Naucoria tuberosa* P. Henn. n. sp. ad inter; P. Magnus, Ein neues *Helminthosporium*, Bemerkungen zur Benennung einiger Uredineen in P. und H. Sydow's *Monographia Uredinearum*.

P. MAGNUS, IN *BEIBLATT ZUR HEDWIGIA*, 42:(305), 28 Dec. 1903, shows that Sydow's use of *Puccinia obtegens* (Lk.) Tul. in place of *P. suaveolens* (Pers.) Rostr. for the rust on *Carduus arvensis*, is not justified. Link's name *Caecoma obtegens* did not appear until 1816 — Sydow's citation “Lk. Obs. II. p. 27 (1791)”

not being correct, for as a matter of fact, "die Dissertatio secunda, in der p. 27 *Caeoma obtegens* Lk. aufgestellt ist, erschien erst in 1816, im 7. Bande des Magazins der Gesellschaft naturforschender Freunde zu Berlin p. 25-45"; but Persoon published his *Uredo suaveolens* in the year 1796.

THE REPORT OF THE STATE BOTANIST 1902, CHARLES H. PECK, N. Y. State Mus. Bull. 67:1-194, Pl. M, N, 82-4, 1903, contains the usual amount of mycological matter. We note 25 new species and varieties described, mostly the higher fungi; under the subhead of Edible Fungi are given popular accounts of *Tricholoma subacutum* Pk., *T. radicatum* Pk., *T. silvaticum* Pk., *Hygrophorus pudorinus* Fr., *Lactarius luteolus* Pk., *Lactarius dulcis* (Bull.) Fr., *Russula crustosa* Pk., and *Cantharellus dichotomus* Pk.; all of these are illustrated in color.

SUCCESSFUL CULTURES WITH CONIDIA OF *CYSTOPUS CANDIDUS*, as reported by Albert Eberhardt, in the Centralblatt f. Bakt. Par. u. Infek. 2. Abt. 10:655-6, 8 Aug. 1903, gave the following results: *from* *Capsella bursa-pastoris*, *on* *C. bursa-pastoris*, *Lepidium sativum*, *Iberis amara*, *Arabis alpina*; *from* *Capsella heegeri*, *on* *C. bursa-pastoris*, *Lepidium sativum*; *from* *Lepidium sativum*, *on* *L. sativum*, *Capsella bursa-pastoris*; *from* *Brassica rapa*, *on* *B. rapa*, *B. oleracea*, *B. nigra*, *Sinapis arvensis*, *Diplo-taxis tenuifolia*; *from* *Arabis alpina*, *on* *A. alpina*, *A. hirsuta*, *A. turrita*, *Lepidium sativum*, *Iberis amara*, *Cardamine pratensis*, *C. amara*, *Capsella bursa-pastoris*, *Senebiera coronopus*.

THE ARTICLES OF SPECIAL INTEREST TO MYCOLOGISTS in Centralblatt f. Bakt. Par. Infekt. Zweite Ab., Bd. X, 1903, are: Müller-Thurgau, Der rote Brenner des Weinstockes; J. Ritzema Bos, Botrytis parasitica und Tulpenkrankheit; Beauverie et Guilliermond, Etude sur le Structure der Botrytis cinerea; Ernst Jacky, Der Chrysanthemum-Rost, II; Neger, Neue Beobachtungen über des spontane Freiwerden der Erysipheen-fruchtkörper; P. Magnus, Kurze Bemerkung zur Biologie des Chrysanthemumroster; Oscar Mayus, Die Peridienzellen der Uredineen; Eberhardt, Zur Biologie von *Cystopus candidus*; Osterwalder, Peronospora auf Rheum undulatum; Jordi, Kulturversuche mit Papilionaceen bewohnenden Rostpilzen.

MYCOLOGICAL ARTICLES OF CONSIDERABLE INTEREST published in the Zeitschrift für Pflanzenkrankheiten during 1903 are: D. Iwanowski, Ueber die Mosaik-krankheit der Tabakspflanze; P. Hennings, Einige Beobachtungen über das Gesunden Pilzkranker Pflanzen bei veränderten Kultur-Verhältnissen; J. Ritzema Bos, Der Brand der Narzissenblätter [*Heterosporium gracile* Sacc., parasitic]; C. J. J. van Hall, Das Faulen der jungen Schösslinge und Rhizome von *Iris florentina* und *Iris germanica* [*Bacillus omnivorum*, etc.]; E. Marchal, Die wesent-

lichsten Ergebnisse einer umfrage über den Getreiderost in Belgium; P. Hennings, Die an Baumstämme und Holz auftretenden teilweise parisitären Blätterschwämme.

DAVID GRIFFITHS DESCRIBES SEVEN NEW SPECIES OF SMUTS and publishes notes on others, with illustrations, which are based on collections made in 1902 and 1903. See Bulletin of the Torrey Botanical Club, 31:83-8, February 1904.

ERWIN F. SMITH AND DEANE B. SWINGLE HAVE ISSUED A VERY EXTENDED AND THOROUGH STUDY of the Dry Rot of Potatoes due to *Fusarium oxysporum*, cf. U. S. Dept. Agr. Bur. Pl. Inds'y. Bull. 55:1-64, Pl. I-VIII, Feb. 16, 1904. This same disease under the name Brown Disease was formerly (by C. E. Bessey, Science, N. S. 15:274, 14 Feb. 1902) referred to *Stysanus stemonites* which these authors say is not a true parasite. The economic aspects are dealt with fully but the taxonomic as well receive proper attention. Synonymy with dates and quoted (and translated) descriptions occupies a page. The proper name to be used for this fungus, generally called *Fusarium solani*, is said to be *Fusarium oxysporum* Schlechtendal (1824). One of the eight illustrative plates gives outline drawings of the mycelium, spores and germ-tubes.

THE GENUS *POLYPORUS* (THE *POLYPORACEAE* OF NORTH AMERICA — VI) is handled by William Alphonso Murrill in the January No. of the Bulletin of the Torrey Botanical Club. Of this he makes *Polyporellus*, *Leucoporus*, *Cerioporus*, and *Melanopus* synonymys. The genus *Polyporus* was established by Micheli in 1729. Linnaeus retained the name *Boletus* for all pore-bearing fungi, and it was Paulet (1793) who securely established the genus. "The general use of *Polyporus* instead of *Boletus* is chiefly due to Fries, who, without knowledge of Paulet's work, 'restored' the name in 1815 and made it popular in spite of Linnaeus". The species of *Polyporus* are mostly small dark-colored plants, attached to fallen branches and decaying wood on or near the ground. But *P. caudicinus* is large and affects living trees. A good synopsis of the 23 North American species precedes the enumeration with comments, synonymy and distribution. Two new names or combinations are made and three new species described.

NEW AND INTERESTING CALIFORNIA FUNGI BY EDWIN BINGHAM COPELAND, *Annales Mycologici*, 2:1-8, pl. I-II., Jan. 1904, contains descriptions of new species—three of *Coprinus*, one of *Battarea*, and one of *Podaxon*—and notes on *Morchella conica*, *M. esculenta* and *M. hybrida*, also a suggestion as to the *Coprinus* cystidia, namely, that they serve as props or braces to hold the lamellae apart. The author observes that in his *C. alnicolus* there can be no danger of the gills sticking together and cystidia are entirely wanting.

ANNALES MYCOLOGICI, VOL. II. NO. 1, JAN. 1904, CONTAINS the following articles: Copeland, New and Interesting California Fungi; Petri, *Naucoria nana* sp. n.; Saccardo, Notae Mycologicae; Dietel, Ueber die Uredineengattung *Pucciniostele* Transchel et Komarov; Sydow, Neue und kritische Uredineen; Rehm, *Ascomycetes Americae borealis*; Höhnelt, Mycologische Fragmente, Fortsetzung; Vuillemin, *Le Spinellus chalybeus* (Dozy et Molkenboer) Vuillemin et la Série des Spinellées; Salmon, Cultural Experiments with the Barley Mildew, *Erysiphe Graminis* DC.

ASCOMYCETES AMERICAЕ BOREALIS, AUTORE DR. H. REHM, Ann. Mycolog. 2:32-7, Jan. 1904, includes notes and descriptions of 16 species of Discomycetes, nearly all of which are new and interesting, collected by Lloyd, Durand, and Harper.

NEUE UND KRITISCHE UREDINEEN, II, VON H. U. P. SYDOW, Ann. Mycolog. 2:27-31, Jan. 1904, includes five new North American species belonging to the genera *Gymnosporangium*, *Phragmidium*, *Uredinopsis* and *Uredo*. A *Gymnosporangium* occurring on *Libocedrus decurrens*, California, was referred to (not described) by H. Mayr in "Die Waldungen von Nord Amerika" (1890) as "*G. libocedri*"—then (in 1898) referred to *Phragmidium libocedri* P. Henn. n.sp. by the latter mycologist. But the specimens destroyed by insects, spores not examined, etc., the Messrs. H. & P. Sydow think "so ist *G. libocedri* am besten ganz zu streichen." Their species, *G. aurantiacum*, occurs on the leaves of the host named—but Mayr's bildet Anschwellungen an den älteren Zweigteilen. Sydow's species and Hennings' *Phragmidium* may be the same thing, according to the former authors.

ELEMENTARY MYCOLOGY.

W. A. KELLERMAN.

It is intended to furnish a series of paragraphs for those who may wish to take up the general study of Fungi. It will be a brief as well as elementary treatment of the subject, calling attention first to the great number and varied character of the plants included in this group, their general structure and mode of life, and then giving an outline of the groups with such illustrations as may seem desirable for the needs of beginners.

MYCOLOGY. — This term is formed from two Greek words, *my-cēs* meaning mushroom or fungus, and *logos*. The real or original meaning of the first Greek word is *slime* or *mucus* — and of course was used to designate these plants — or the peculiar material which in the early days was not really understood and not at all supposed to be closely allied in fundamental structure and mode of life to our common plants. Some of the plants

belonging to this group are really *slime-like* or of the consistency of thin jelly in their early stage; they are called the "Slime Moulds." But they are not often observed except by botanists, being mostly minute in size, living in retired places, as shady woods, etc., — rotten logs being a favorite habitat of many of the species. Many of the common Mushrooms also are fleshy, that is, of soft consistency — and it is therefore readily understood why the term *Mycology* was formed to indicate the division of Botany which has to do with the group of plants under consideration.

FUNGI. — A suggestion regarding the word itself may be timely. Simple as it is, the term is not always spoken correctly. *Fun'-gus* is to be pronounced like "bo'-gus," with the *g* hard; but the plural, *fun'-gi*, has the *g* soft, and therefore is pronounced "fun-ji" — the accent being on the first syllable, and the *i* in the last syllable long, hence should be pronounced like "eye". The plants constituting this group are numerous and exceedingly varied in outward structure. Those known to all, are the Mushrooms, Toadstools, Morels, Puffballs, Truffles, Rusts, Smuts, Black Knot of Plum and Cherry trees, the "Cedar Apples," Moulds, and Mildews. The Bacteria are usually included in the group of *Fun'-gi*; they are plants of simple structure and exceeding minuteness, but the work they do as agents of fermentation and decay of organic matter, souring milk and curing cheese, disintegrating even mineral and vegetable matter in soils, and as agents of many of the diseases of man and the lower animals, is everywhere witnessed. The various kinds of rots and decays of fruits and vegetables are induced by species of fungi. The common diseases of fruit trees, such as the Peach 'leaf-curl,' Plum 'pockets,' Anthracnose of Raspberries, Grapes, etc., as well as the Ergot of Rye, the Club-root of Turnip and Cabbage, Crown-gall of some of the fruit trees, and 'witches-brooms,' are abnormal growths, or injured tissue due solely to the attacks of various kinds, mostly microscopic fungi. The Yeast plant is another fungus — its simple structure and minute size being in inverse proportion to its usefulness — having been cultivated from time immemorial and like other domesticated plants as Maize, Wheat, Olives, etc., not known in the wild state. The existence of still another large group of parasitic fungi is witnessed by the "Leaf spots," or little areas of dead tissue in living leaves of many herbs, shrubs, and trees during the growing season. A leaf may be so severely attacked as to succumb entirely — large irregular areas of dead tissue soon manifest, then the entire leaf turning yellow and dying; the young twigs also are sometimes involved. The fungi themselves are invisible — the destructive work only revealing their presence; a microscope is necessary for their detection.

VEGETABLE LIFE. — An epitome of the known processes of life and growth of our common plants, and their minute structure may serve as a basis for brief explanation of the structure and mode of life of the Fungi. The herbs, shrubs and trees develop roots in the soil which terminate in minute fibrils that push out between the finer particles of which the soil is composed. These tiny rootlets have near their tips, during the growing season, an abundance of slender tube-like outgrowths, called *root-hairs*. These delicate elongated *cells*, as such structures are called, apply themselves closely to the soil particles and absorb the thin layer of adhering moisture. This moisture or water has passed previously through the atmosphere—falling as rain or water on the surface, then slowly percolating through the soil, dissolving very small quantities of triturated rock (for that is what soil mainly consists of) and some of the partially decomposed organic matter that may also be present. Water is not a good solvent for granite and marble, nor even for the softer limestone, but its disintegrating power is greatly increased by the carbon dioxide and traces of other gases it absorbs in passing through the air, but especially by the larger quantity of these substances, together with various alkalis which it takes up in percolating through the soil. It therefore happens that ample food materials for our common plants is held in dilute solution in this thin layer of moisture which the root-hairs seek and abstract from the soil particles. The root-hairs—like all other ordinary living vegetable cells—consist of an active, more or less granular but nearly transparent substance, in consistency somewhat like thin jelly, detected but little over half a century ago and given the name of *pro'-to-plasm*. It is this—the physical basis of 'life' as interpreted to-day—which does the work of absorption—pulling the water-particles away from the attracting soil particles and appropriating the booty for its own use. The cell 'wall,' or tube (covering) referred to above, is permeable to liquids allowing the water to pass readily. Whether this absorptive power of the protoplasm is referable simply to the physical process called 'osmosis' need not concern us here—it is exhibited at any rate only in the *living* protoplasm. The roots, stems and leaves are made up exclusively of cells—that is, tiny masses of protoplasm with a delicate covering or wall (the material of which is cellulose) which are joined to one another to make the firm plant body. Moreover the cells have taken on various shapes, round, angular, elongated, etc., and some of the walls become much thickened, often hard, and thus the plant body is complex in structure—though in the very early stages of its development it was comparatively simple. Now, the water, which contains the food-material in solution, passes from cell to cell—through the walls and through the protoplasm, reaching

finally the leaves and other green parts of the plant. Here in the presence of sunlight, the material is decomposed by the protoplasm, new compounds are formed, and these further changed by processes, not yet fully understood, into products also not yet physically and chemically elucidated. But the digested material finally undergoes assimilation, or change into the vegetable fabric of the plant body.

RESPIRATION. — So important a life process as the consumption of oxygen deserves brief but special consideration. Taking carbon dioxide from the air and various other food materials from the soil, was outlined in the previous paragraph; the decomposition of these substances into simple elements and recombination into simple and complex compounds, which takes place in the protoplasm of the common plants, in those cells in which chlorophyll is present — the energy derived from the sun (i. e. light energy) appropriated for the performance of this important work, — have also been briefly mentioned. But this complicated work is done only when an ample supply of oxygen is at hand. If no air (oxygen) is present in the soil, the root-hairs and the rootlets are unable to perform the work of absorption. If the leaves are deprived of oxygen the protoplasm in their cells likewise ceases its activity. Not only common observation, but accurate experiments as well, indicate the necessity of oxygen to the performance of what we call the vital activities. It is true for all organisms — whether vegetable or animal, whether simple or complex in structure or form.

LIFE-OUTLINE OF A FUNGUS. — The fungi are simple in structure and destitute of green matter — a substance that will hereafter be referred to as *chlo'-ro-phyll* (the word itself meaning 'leaf-green'). They manifest simple life processes, though fundamentally these are the same in all organisms whether plants or animals, whether the structure is simple or complex. The most conspicuous distinction when contrasted with the common plants is their lack of chlorophyll; fungi may be hyaline, white, black, brown, yellow, or almost any other color, but never green, at least they are not green like common vegetation in which this universal coloration is due to the presence of chlorophyll in the cells. Evidently then their mode of life is very different; they can not manufacture their food material out of carbon dioxide, water, and other mineral substances. Consequently they must get their food — already prepared or partly digested — directly either from living plants or animals, or from the organic matter in which the life-processes have ceased to manifest themselves, the so-called dead matter. If they take their food from living organisms we say they are *parasitic*, but if they affect dead matter (which they decompose to greater or less extent) we say they are *sap-ro-phyt-ic*. Whether they obtain food from living or-

ganisms or decaying matter the fungi may inhabit only the surface of the host or matrix; the absorption may be direct or suckers, usually very simple, may be developed that penetrate to some depth. They may however reside only in the interior of the host, or deep-seated in the nourishing substance. An example of the former is seen in the common Leaf Mildew a whitish or later dingy coating on leaves of the Lilac or of the Cherry; of the latter may be mentioned the bacteria that cause splenic fever or tuberculosis. Some fungi may live on the surface in part and concealed in tissue in part. The oxygen necessary for the activity of these organisms may be taken from the atmosphere or in case of some of the simpler fungi it is abstracted from the tissues or the mass of organic matter they occupy — necessarily disintegrating or decomposing the latter.

STRUCTURE OF FUNGI. — Special structures or organs of plants and other organisms have doubtless arisen in response to their needs; it is plain at any rate that the organs are in general adapted to the functions to be performed. The slender tubular root-hairs of the land plants are well fitted to absorb moisture from soil particles and the leaves by their expanded form and peculiar structure take carbon dioxide from the air, exhale moisture and collect the oxygen necessarily consumed in the liberation of energy requisite for the performance of various processes. Such forms and mechanical structures as trunk, stem, branches, and twigs, or leaf stems, are developed for the support of the leaves which must be hung out to the sun and bathed in the air. So important physiologically is this display of foliage that the modern botanists describe the leaf as a 'light-related organ' and refer its peculiar structure to the character of the work to be performed. The floral leaves — using this word to include all the organs of the flower — have very different and peculiar functions to perform, and they in turn are of such form and structure as suits the work to be done. Now, the Fungi gain their livelihood without chlorophyll — hence possess no leaves; having no leaves to support and display, they have need of no twigs, branches or stems. Resting on other plant bodies or growing within tissues their cell walls need not be lignified, need not be thickened nor of large dimensions. As a matter of fact the plants of this group are often extremely simple as well as very minute. Even when they are large, as for example a Mushroom, the cells of which they are composed are very simple and homogenous as compared with what is found in the varied and complex tissues of a vine or a tree.

ALGAE. — When contrasted with Algae (pronounced *al'-je* — the *g* having the sound of *j* in the word *jeer*), which are closely related in structure to the Fungi, the conspicuous difference is in the presence of chlorophyll in the former and its

absence in the latter. In botanical classification the Algae are generally placed lower than the Fungi, but while an Alga (here the *g* is hard as in the word *toga*), in case of some species, consists of a single small cell, some of these aquatic plants are very large and remarkably complex in external form and internal structure. As examples of the latter, may be cited the conspicuous Marine Algae, the so-called Sea-weed, Sea-moss, the Kelp, Sargassum, etc., as well as our common fresh-water Stoneworts, or Chara. The latter species consists of upright green plants, six to eighteen inches high, growing under water in clear shallow lakes or ponds, with their numerous regular branches in successive whorls, disposed at regular intervals on the stem. The species which form the Pondscums, or Green-felt in standing water, and the bluish-green, somewhat slimy coating on mud, or on the water's margin in muddy pools, are less complex than the Red or Brown Algae of salt water, or the ornamental Chara mentioned above. It is scarcely necessary to add that the Algae manufacture their own food out of inorganic materials — not being dependent on other organisms as the Fungi are, they are of course never parasitic. Aside from this physiological difference the two groups are remarkably alike and by many botanists are placed side by side — the lower Algae with the lower Fungi, and so on through the entire series — all together forming one of the large groups of the Vegetable Kingdom.

FUNGI DERIVED FROM ALGAE. — In the evolution of the vegetable kingdom it is reasonable to suppose that the simple Algae — possessing chlorophyll and being able to convert mineral matter into organic food and fabric — preceded those plants destitute of chlorophyll and which therefore could not live independently. Besides, thorough study in plant morphology and phylogeny (unfortunate words to use here but they will be elucidated later) has led botanists to the conclusion that the Fungi have actually descended from, i. e. really grown out of the simple Algae, — and it is believed also that from this same group of interesting plants, the Algae, our Higher plants have originated, even our Ferns and common Flowering plants! We can easily conceive that the simple Blue-green Algae living in stagnant pools where the water is highly charged with decaying or partially decomposed organic matter, may directly absorb some of this as a part of their food. Having then less need of the chlorophyll, some forms may have, in the course of a long series of generations, entirely lost this important green substance — when they would be called Fungi. Or if we imagine that a sudden change, a 'mutation,' took place, due to the 'rythmic' flow of life, or to the 'inherent' tendency to variation in successive progenies, yet we would think the evolution took place along the line suggested — namely, Alga to Fungus.

(To be continued.)

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NOTES.

Though, in the language of a correspondent, "The Index [to North American Mycology] certainly covers the ground in good shape and does not leave anything more to be desired" [the compliment is appreciated!], — it would doubtless be a matter of advantage to all mycologists for the indexer to receive the suggestions of everyone who sees any possible point of vulnerability in the plan or execution, with a view to improvement. Temporary omissions will doubtless always occur, but publishing frequent installments makes prompt completion feasible. Notices of any omission or other mistakes are earnestly solicited. I may say that giving "ground" and other too vague matrix for the higher fungi will not be continued, considered quite useless.

I wish to thank Mr. P. L. Ricker for suggestions and for kindly calling my attention to certain corrections which have now been made. I may add that he finds it a good plan to divide the card index (made by clipping the items from the Reprints and attaching to library cards) into three parts, namely, (1) Hosts; (2) New species, new genera, synonymy, culture work for named species; and (3) Subjects.

THOSE who have not practiced till perfect in pasting slips on library cards, might perhaps profit by the suggestion, that when these are narrow as in case of the items from the Index of North American Mycology, and attached (of course by paste at the ends only) near the upper edge, it is desirable to add near the lower edge of the card a narrow slip of paper (should be cut from the margin of the same pages, because of same thickness) — otherwise there is unequal thickness above and below in the pile or row of cards in the drawer.

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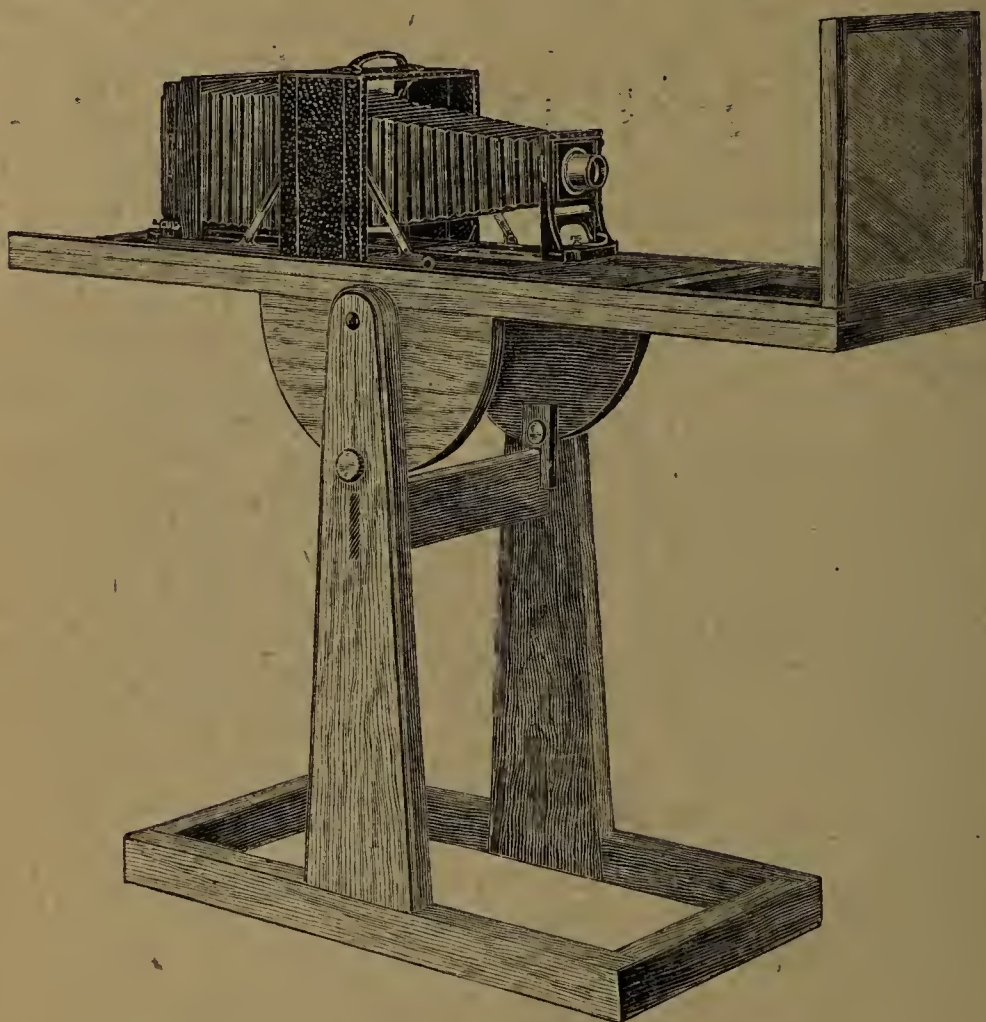
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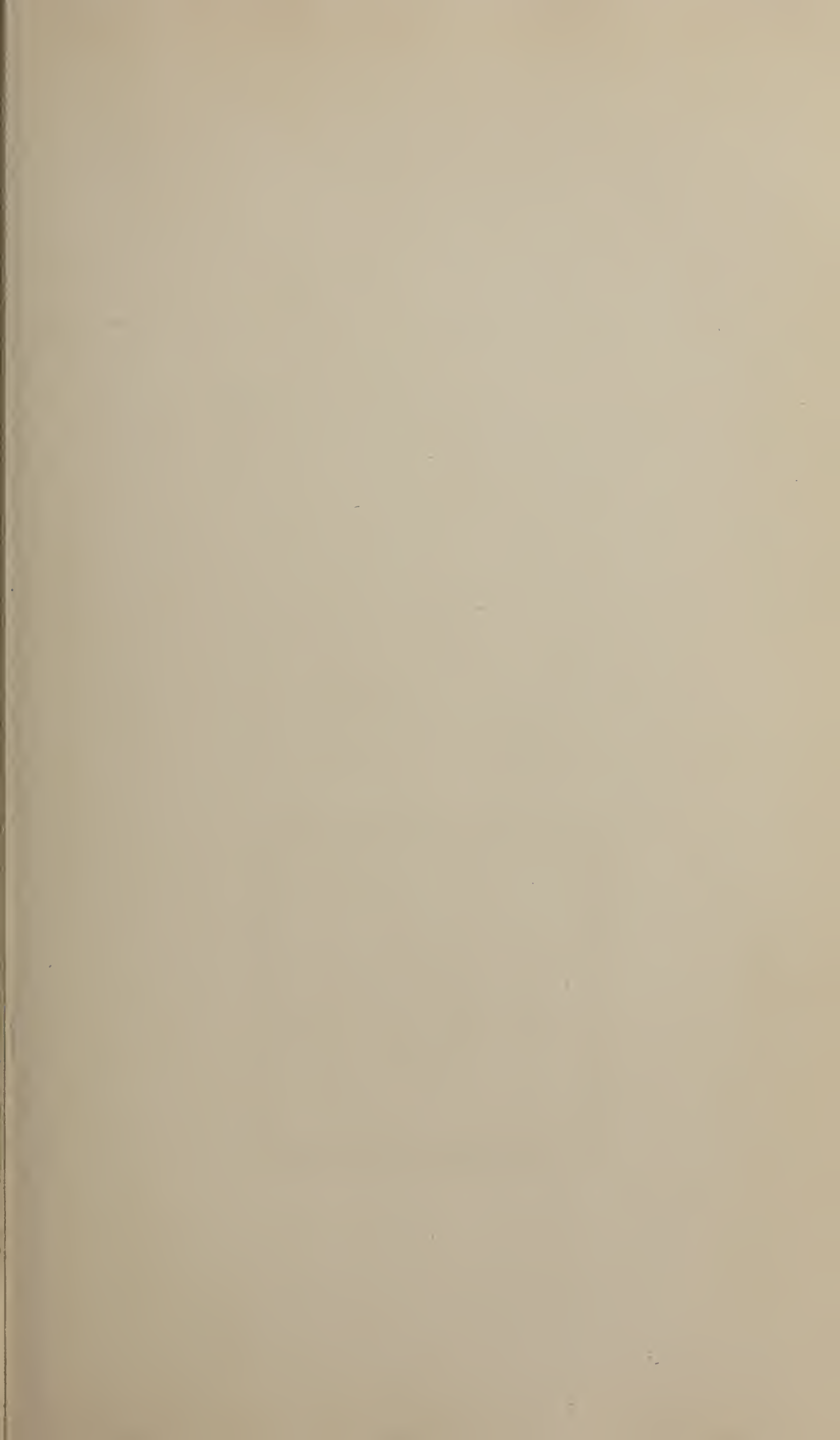
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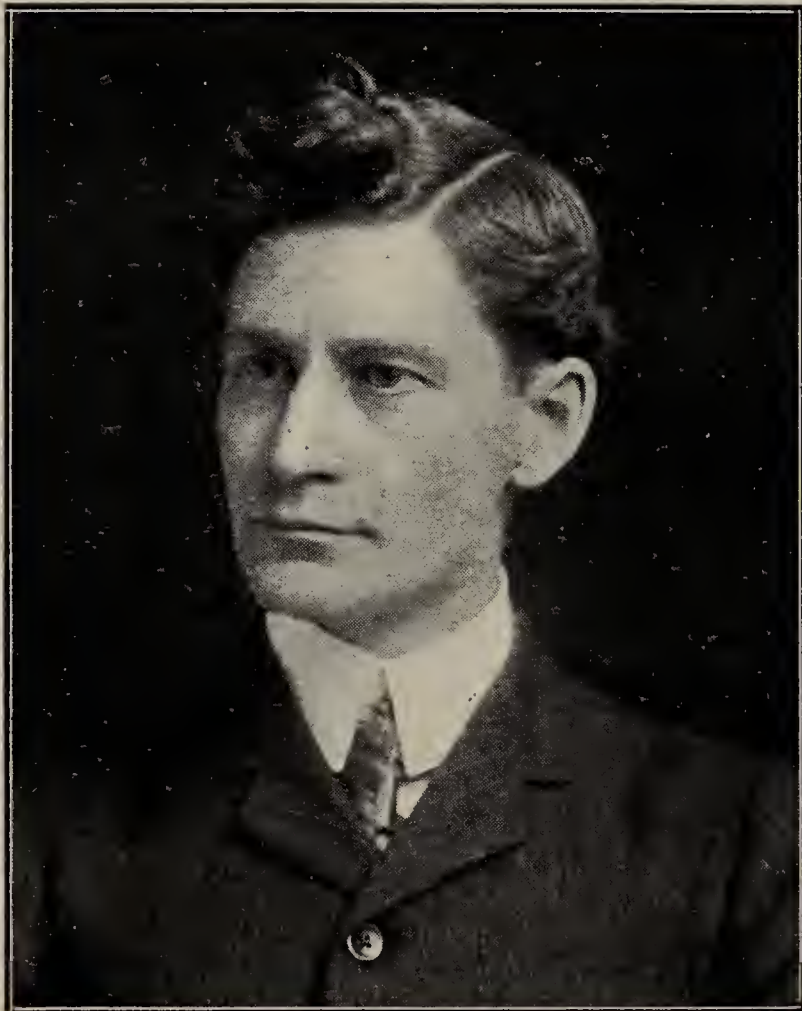
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TUBERCULARIA FASCICULATA TODE.

A. P. MORGAN.

TUBERCULARIA FASCICULATA, caespitosa, aurae, margine obsoleto, compresso. Tode, fung. Meckl. 1790. Also Gmelin, Syst. Nat. 1791.

This plant next appears in Persoon's Synopsis (1801) as PEZIZA CARPINEA, the name apparently credited to Ehrhart. In Persoon's Mycologia it stands under the same name with two subspecies additional. In Fries's Systema Mycologicum (1823) Tode's species is appended to *Ditiola* for further inquiry. In the S. V. S. it is called DERMATEA CARPINEA (Ehrh.). I do not find the species anywhere in Schweinitz's N. A. Fungi. Mr. Lea found specimens on Hornbeam, Cincinnati, Oct. 31, 1839. Berkeley named these PATELLARIA CARPINEA, remarking "This is not a good *Peziza*" and adding "it appears to me evidently congeneric with *Peziza rhabarbarina*, Berk." The synonymy of this last species is very extensive. See Philip's Discomycetes. I may say it brings up in Masee's Fungus-Flora as *Scleroderris rubi*.

Tode's species finally rests in Saccardo's Sylloge under the name PEZICULA CARPINEA (Pers.) Tul. Carp. III. Starting as a *Tubercularia* alongside of *T. vulgaris* Tode, it has since occupied a place in three different families of Discomycetes.

The following species while answering perfectly to the fungus named and described by Tode differs altogether in its microscopic detail from *Pezicula carpineae* Tul.

DERMATELLA SCOTINUS Morgan sp. nov.—Apothecia erumpent-caespitose, fleshy-fragile, subturbinate, whitish or alutaceous; the disk plane or convex, farinaceous. Asci cylindric, with a short stalk, paraphysate, 4-8-sporous, the spores obliquely uniseriate, 150-170 x 15-20 mic.; spores at first oblong, hyaline and continuous, becoming inaequilateral or slightly curved and transversely 1-3-septate, finally brownish with occasionally one to three oblique or longitudinal septa, 25-30 x 10-12 mic.

On *Carpinus americana*, growing out of the inner bark through the periderm; Preston, O. December, 1897. The apothecia .5-1.0 mm in diameter, more or less irregular from the mutual pressure, few to several in each tuft. The asci may contain eight immature spores, but they do not appear to mature all of them. This species belongs in the second section of *Dermatella* along with *Dermatella fagi* (Phillips).

A NEW EGG PLANT FUNGUS.

CLAYTON O. SMITH.

During the month of September and October, what has proved to be a new egg-plant disease, made its appearance in certain parts of Delaware. For some time it was thought to be *Phyllosticta hortorum* Speg., reported by Halsted as found in New Jersey on *Solanum melongena* L. A careful comparison with Halsted's material showed the two to be distinct. It is quite probable that these two have been confused with each other.

Ascochyta lycopersici Brun. Spots occurring both on the leaves and fruit of *Solanum melongena*. Leaf-spot 0.5-2 cm. and more in diameter, subcircular or irregular, reddish brown sometimes with a darker colored center and often with a darker margin, the zone between being of a lighter color. Dark concentric ridges of elevated plant tissue are generally present. Fruit spot large 2-10 cm. or more in diameter, of the same color as rind of fruit or often a pale flesh color with darker zones. Perithecia submerged forming at first slight elevations in the tissue, at length superficial, black, scattered; spores guttulate with oil drops and continuous, but at length uniseptate, hyaline, slightly constricted at septum, 6-12 x 3.5-4 μ .

This fungus differs from *Phyllosticta hortorum* Speg. both in size and septation of spores and in character of leaf spot.

The spores of *Phyllosticta hortorum* Speg., in material collected by Halsted, agree in size with those as given by Saccardo, 4-6 x 2-2.5 μ while those in this *Ascochyta* are nearly twice that size, 6-12 x 3.5-4 μ .

The leaf spot of *P. hortorum* is described as yellowish with a gray center while in this *Ascochyta* it is reddish or brownish in



Ascochyta lycopersici Brun. Figs. 1-3, different stages in spore development from continuous to uniseptate; 4, germinating spores showing constrictions; 5, 6, two spores drawn with cam. luc., Leitz oc. 18, obj. $\frac{1}{12}$.

color. The perithecia in Halsted's material of *P. hortorum* are small, black and superficial, while in this *Ascochyta* they are usually submerged in the leaf tissue and the spot is often characterized by elevated concentric ridges of leaf tissue.

This *Ascochyta* agrees so well with *A. lycopersici* that it has been referred to that species, but no authentic specimens have been found with which to compare it. It differs from *A. lycopersici* in having broader spores and in growing on a different host from which it has ever been reported.

By inoculation experiments from pure cultures it has been proven that this *Ascochyta* is parasitic on *Solanum melongena*, *Solanum lycopersicum*, *Solanum carolinense* and *Datura tatula*.

Delaware Experiment Station.

NOTE.—The author kindly sent specimens of the fungus commented on, with request that the spores be critically inspected. Immediately upon the addition of eosin the uniseptate character of the mature spore was evident — showing that the fungus had been referred to the proper genus. Drawings 5 and 6 were added to the author's list of figures.— [EDITOR.]

THREE NEW SPECIES OF DISCOMYCETES.

ELIAS J. DURAND.

The following species of Discomycetes are probably undescribed, and it seems desirable for various reasons to present diagnoses at this time.

LACHNUM ATROPURPUREUM Durand n. sp.—Plants solitary or gregarious, stipitate, single or occasionally several cups (1-6) at the summit of a common stem. Disk concave, pale purple, $\frac{3}{4}$ -1 mm. diam., externally dark purplish brown, paler toward the margin, clothed densely with hairs which are pale purple by transmitted light, cylindrical, smooth, closely septate, rather thick walled, paler toward the tips, up to 80μ long, 5μ thick; stem slender equaling the diameter of the cup. Asci clavate-cylindrical, $40-50 \times 5-6\mu$, apex rounded, scarcely narrowed, not blue with iodine. Spores 8, uniseriate, hyaline, smooth, continuous, elliptical to elliptical-oblong, $6-8 \times 2.5-3\mu$. Paraphyses scarcely longer than the asci, narrowly lanceolate above, acute, $3-4\mu$ thick.

On *Eucalyptus*, Stanford Univ., Cal., E. B. Copeland. C. F. Baker, Plants of the Pacific Slope, no. 2724. Com. F. S. Earle.

A beautiful species peculiar in the often clustered cups, the purple tint of every part, and the small spores. *Dasyscypha eucalypti* (Berk.) Sacc., from Tasmania, is quite different. The often branching stem is a character shared by such species as *Dasyscypha pygmaea* and *D. comitessae*. It is suggestive of the condition in *Cordierites*, but the other characters are those of *Lachnum*.

DERMATEA CRATAEGICOLA Durand n. sp.—Plants erumpent, solitary or cespitose, 2-4 together arising from a common stroma, narrowed to a short thick stem-like base, .5-1 mm. in diameter, orbicular or irregular from mutual pressure. Disk pruinose, olivaceous, externally mealy-pruinose, rhubarb-color; margin obtuse; crushed flesh rhubarb-color. Asci stout, clavate, apex rounded, not blue with iodine, short stipitate, at first filled with homogeneous granular protoplasm, $150-165 \times 25-30\mu$. Spores 6-8, obliquely uniseriate or biseriate, hyaline, smooth, continuous, oblong-elliptical, with a large central vacuole, $35-48 \times 15-17\mu$. Paraphyses hyaline, branched, cylindrical, the apices clavate-thickened, yellow or olivaceous-yellow, $6-8\mu$ thick.

On stems of *Crataegus* sp., London, Ontario, Oct. 18, 1903. J. Dearness (no. 2994).

Related to *D. olivacea* Ell., but differing in the rhubarb-colored exterior. This may possibly be the form described by Rehm as *Ocellaria aurantiaca* var. *crataegi* Lasch. (Disc. pp. 135 & 1251). That description was based on *Tympanis crataegi* Lasch, in Rabenhorst F. Eur., no. 353. But the specimen under this number in the Cornell Herbarium certainly does not agree with the plant described above, being densely cespitose, whitish pruinose externally, and having the habit and appearance of *Tympanis conspersa*. Again, our plant may be *Pezicula crataegi* (Awd.) Fckl., Symb. Myc. Nacht. II. p. 56, but we cannot know because this species has never been described. Rehm (l. c.) makes the *Pezicula crataegi* Fckl. a synonym of the *Ocellaria* mentioned above. This again is uncertain for the reason stated.

Finally Hazslinski (Mag. Szab. Disc. 220) gives the spores of what he took to be *Pezicula crataegi* Fckl. as 22-24 x 10 μ . This in turn cannot be our plant. The species described above is a true *Dermatea*.

DERMATEA PUBERULA Durand n. sp. — Erumpent, usually forming elongated rows or patches bursting through clinks in the bark, sometimes 2-3 cm. long. Ascomata .75-1 mm. in diameter, 2 to many arising from a common stroma, whole plant cinereous, externally pulverulent with short hairs which give rise to cylindrical-clavate, hyaline, straight or curved, 1-celled conidia, 30 x 6 μ . Asci clavate, apex rounded or usually truncate, pore violet with iodine, 150 x 12 μ . Spores 8, obliquely uniseriate, hyaline, smooth, continuous, elliptical, 15-20 x 9-10 μ . Paraphyses filiform, hyaline.

On dead stem of *Vitis* sp. hanging from a tree, Fall Creek, Ithaca, N. Y., January 13, 1898. E. J. Durand (Herb. Cornell no. 15096).

The plants are for the most part immature, only a few asci with spores being found. There are indications that the spores may become 1-3-septate at maturity. If so the plant would be a *Dermatella*, but different from *D. viticola* E. & E. The external hairs are not more than 10-15 μ long.

Botanical Department, Cornell University.

VARIABILITY IN OUR COMMON SPECIES OF DICTYOPHORA.

A. H. CHRISTMAN.

Considerable uncertainty has existed as to the identification of our common species of *Dictyophora*. Fischer¹ remarks that nowhere among the Phalloideae is the confusion in the nomenclature so great as in the case of this genus and he believes that this confusion has been brought about by the naming of isolated specimens which have been given new specific names on the ground of some slight lack of agreement with descriptions already given.

Bosc², in 1811, was perhaps the first to report this fungus from America. He collected specimens in South Carolina and referred them to the genus *Phallus* with the specific name *duplicatus* Bosc.

Schweinitz³ reported *Phallus duplicatus* Bosc and *Phallus*

¹ Untersuchungen zur vergleichenden Entwicklungsgeschichte und systematik der Phalloideen. Ed. Fischer,—Denk. der Schweiz. Nat. Gesell., Bd. XXXI,¹ 1. 1890.

² *Phallus duplicatus* Bosc. Bosc,—Gesell. Nat. Freunde zu Berlin, Vol. V., p. 86. Plt. VI, Fig 7.

³ Synopsis of North American Fungi, Schweinitz,—Trans. of American Phil. Soc., Vol 4, p. 252. 1831.

indusiatus Vent. in 1831 and *Phallus Daemonum* Rumpf. was reported from Ohio by Berkley¹ in 1869. In 1873 Berkeley² gave a synopsis of the Phalloideae of North America and includes the three species mentioned above. He also gives localities from which they are reported and the names of the collectors, as follows: *P. duplicatus* Bosc reported from South Carolina by Wright; *P. indusiatus* Vent. from South Carolina by Ravenel and *P. Daemonum* Rumpf. from Alabama by Peters and by Ravenel.

In 1880, Gerard³ listed the Phalloideae reported from the Vol. VII, p. 11, 1880.

United States. The indusiate forms mentioned in this list are the same as those mentioned in Berkley's synopsis.

E. A. Rau⁴ of Pennsylvania in 1882 found three specimens of what he suspected to be a new species of *Phallus*. Photographs were sent to Kalchbrenner and to other mycologists. Kalchbrenner concluded that the large trumpet-shaped veil and the small meshes toward the margin of the veil were characters of enough importance to distinguish this as a new species. He named the form *P. togatus* Kalch. The dimensions of the parts are as follows: Total height 18.7 cm., height of pileus 4.8 cm., length of veil 6.4 cm., diameter of volva 6.6 cm., diameter of stipe at the top of the volva 3.4 cm., diameter of the stipe at the lower margin of the pileus 2.8 cm.

Another supposedly new species *Phallus collaris* Cragin was reported and named by F. W. Cragin⁵ in 1885. Two specimens were found in Shawnee County, Kansas. They were rather large and stout. Other distinguishing characteristics noted were the large pore at the apex of the stipe, the remnant of the peridium borne on the top of the pileus and the short veil, with large polygonal perforations, torn loose from beneath the pileus and protruding from the mouth of the ruptured volva. The measurements of this form are given. Total height 12.5 cm., height of pileus 4.4 cm., length of veil 1.8 cm., breadth of stipe at the base of the pileus 2.5 cm., at the summit of the volva 3.1 cm., breadth of the pileus 2.9 cm., breadth of the volva 5 cm.

In 1888, A. P. Morgan⁶ included both *P. duplicatus* Bosc and *P. Daemonum* Rumpf. in a synopsis of North American Fungi. According to his descriptions *P. duplicatus* has an acute pileus and a long, often ragged veil, while *P. Daemonum* has a shorter

¹ Cuban Fungi. Berkeley,—Lin. Soc., Trans. of, Vol. X, p 343.

² North American Fungi. Berkeley,—Grevillea II, p. 33. 1873.

³ List of United States Phalloideae. Gerard,—Bull. Tor. Bot. Club,

⁴ A New *Phallus*. Rau, E. A., Bot. Gaz., Vol. VIII, p 223.

⁵ *Phallus collaris*. Cragin, F. W.,—Bull. Washburn College Lib. of Nat. Sc., Vol. I, No. 2. 1885.

⁶ North American Fungi. Morgan, A. P.—Journal, Cincinnati Soc. of Nat. Hist., Vol. II, p. 141. 1888.

veil and the apex of the pileus is truncate. In other characters they are very much the same.

In a paper in 1890, Fischer¹ concludes that the five forms reported in the United States should all be included under *Dictyophora phalloidea* Desvaux. This species Fischer then subdivides into four varieties. Var. *Campanulata* Fischer is characterized by the absence of a collar surrounding the pore at the apex of the pileus, the flattened pseudoparenchymatous ridges on the outer surface of the pileus and the flattened bands of the veil. Var. *typica* Fischer has a collar at the apex of the pileus. The ridges on the pileus are high, even, and are pseudoparenchymatous. They continue into the collar at the apex. The veil is composed of cylindrical bands. Var. *duplicata* (Bosc) Fischer under which Fischer places our American forms, is characterized by a very broad collar at the apex of the pileus. The ridges are very high and toothed. The pileus and ridges have a hyphal structure. The veil has smaller meshes than either of the preceding varieties, the openings becoming smaller toward the free margin where it becomes almost membranous. Var. *Farlowii* n. var. Fischer differs from the others in having a non-reticulate pseudoparenchymatous veil.

In a later paper² Fischer adds two more varieties, making in all six varieties of *D. Phalloidea* Desvaux. These two are var. *Guyanensis*, n. var. Fischer, which has the surface of the pileus almost smooth, and var. *Lauterbachii* Fischer which has low ridges very irregularly placed.

Burt³ in 1896 combined all the forms from the United States having a reticulate veil under one species, *D. duplicata* (Bosc) Ed. Fischer.

Fischer in a later paper⁴ raises *D. Phalloidea* var. *Farlowii* Fischer to specific rank. This leaves *D. Phalloidea* Desvaux embracing five varieties.

The occurrence of this common *Dictyophora* in unusual numbers in the neighborhood of Madison during the summer of 1903, made it possible to make some interesting observations on the variability of the characteristic parts of the fungus. The specimens were found in the region lying along the south shore of Lake Mendota and extending a mile west of the city. The soil of this region is covered with a sod shaded at places by growths of trees and is at other places completely open. Along a drive, leading through this tract, young forest trees had been planted

¹ Loc. cit.

² Neue untersuchungen zur vergleichenden Entwicklungsgeschichte und systematik der Phalloideen. Ed. Fischer,—Denkschriften der Schweiz. Nat. Gesell., Bd., XXXIII. 1893.

³ *Phalloideæ* of the United States. Burt, E. A., Bot. Gaz. Vol. XXII, p. 387. 1896.

⁴ Untersuchungen zur vergleichenden Entwicklungsgeschichte und systematik der Phalloideen. Fischer, Ed,—1890.

from year to year. There is also a plot of about four acres on the University farm planted about eight years ago with various young forest trees. All of these young trees had been liberally mulched yearly, from the time of planting, with a fertilizer composed of equal parts of shavings and dung, and it was in and beneath this mulch that the fungi were most abundant.

So numerous were the plants on the entire region that for a period of six weeks specimens could be found every day. As many as two dozen were often taken on a single morning. Probably as many as three hundred specimens were handled during the season. These were examined and types of all sizes and proportions were carefully measured and then preserved by drying or in alcohol. When it was desired to get a series of plants belonging to the same mycelium, certain clusters of the eggs were marked and specimens gathered from day to day as they matured.

In making the measurements it was aimed to secure specimens showing all possible variations. The following table gives

MEASUREMENTS * OF TWENTY SPECIMENS OF PHALLOIDEÆ.

Number.	Height of Plant.	Vertical diameter of Volva.	Transverse diameter of Volva.	Vertical diameter of Pileus.	Transverse diameter of Pileus at Margin.	Length of Veil Below Pileus.	Diameter of Stipe at Margin of Pileus.	Diameter of Stipe at Apex of Volva.	Dimensions of Apical Pore.	Breadth of Collar around Apical Pore.
1	21.2	6.0	5.5	4.7	4.3	3.0	3.6	2.5	.6 x .4	1.2
2	19.5	5.0	5.0	4.0	3.6	1.5	3.9	2.5	.6 x .6	.4
3	19.1	3.6	4.5	4.5	2.8	2.0	3.5	1.8	.6 x .2	.0 ¹
4	19.0	5.0	6.0	4.0	3.8	6.0	3.2	2.2	.5 x .4	.6
5	18.9	6.0	5.5	4.1	3.5	2.7	3.7	2.5	.7 x .4	.5
6	17.9	5.0	6.5	4.1	4.6	0.2 ²	4.2	3.0	.6 x .4	.0 ¹
7	15.6	5.0	5.0	3.6	2.7	3.3	3.7	2.5	.6 x .4	.5
8	15.6	4.6	0.0 ³	4.0	3.8	5.5	3.6	2.5	.7 x .6	.8
9	15.2	5.0	6.3	4.0	4.0	3.0	4.2	3.3	1.0 x .0 ⁴	.2
10	15.0	5.5	6.0	3.5	2.7	1.8	2.7	2.0	.5 x .4	.4
11	14.4	5.0	4.0	4.2	2.6	3.5	2.6	2.0	.5 x .4	.5
12	13.7	4.2	4.0	3.5	3.0	2.0	2.3	2.0	.4 x .3	.5
13	13.4	5.0	4.5	4.1	3.5	1.0	3.2	2.8	1.2 x .2	.3
14	13.0	4.0	4.8	2.5	2.5	4.0	2.2	1.6	.6 x .0 ⁴	.2
15	12.8	4.5	5.3	3.0	2.9	3.0	3.8	2.5	.8 x .0 ⁴	.2
16	12.2	4.8	4.5	2.7	3.7	0.0 ²	3.8	3.2	0 .0 ⁵	.0 ⁶
17	11.8	4.2	4.6	2.6	2.7	0.0 ³	2.5	1.5	.5 x .4	.3
18	11.7	4.5	5.5	3.6	4.0	3.6	3.4	3.2	.8 x .5	.5
19	9.7	3.6	3.7	2.1	2.0	1.5	1.7	1.4	.4 x .2	.4
20	5.6	2.4	3.0	2.2	2.1	0.0 ²	1.2	1.0	.3 x .2	.1
Average ..	14.76	4.62	4.67	3.55	3.28	2.5	3.15	2.3	.62 x .31	.36

* All measurements are given in centimeters.
¹None. ²Just visible. ³Torn. ⁴Closed. ⁵Not taken. ⁶Very slight.

the dimensions of twenty plants including specimens showing the extreme variations in all of the characteristic parts of the plant. The specimens are arranged in the table according to height.

It will be seen that the extremely tall and extremely short specimens are not so numerous in the above table as are the more nearly average ones. As these are about equally scarce also in nature the above averages may safely be taken as approximately correct for all the specimens found during the season.

There is a fairly complete series from the shortest (5.6 cm.) to the tallest (21.2 cm.). Careful observations were made to determine, as nearly as possible, what conditions might be responsible for the height of the specimen. It was found that without exception the tall plants were solitary, were taken from sod, and, in almost every case, were in a fairly shaded, moist locality. Numbers 1 to 6 of the table, and many others, were found so located. The smaller specimens were found where the plants occurred in large clusters and were often taken after several plants in the cluster had matured. When a plant in the egg stage was found on a substratum, such as the mulch already mentioned, that readily became dry, it could be predicted with certainty that the resulting fungus would be small. Very immature eggs ($\frac{1}{2}$ to $\frac{3}{4}$ size) were often separated from their mycelial connections and taken into the greenhouse. These often decayed. A good share of them, however, developed after several days producing very small specimens. This indicates that food and moisture, together with the habit of growing singly or in clusters are important factors in determining size.

The volvae varied in size from 5.5 x 6 cm. to 2.4 x 3 cm. Where the eggs were in large groups they were often flattened against each other. A peculiar lobing was often caused in this way and also by foreign objects lying in contact with the egg. Eggs lying free in sod were spherical and smooth. The color of the eggs varied from white to pink or dirty brown.

The size and shape of the pileus was as variable as the other characteristics. The taller plants in general had the larger pilei. The shape varied from a broadly campanulate pileus, 2.7 cm. high by 3.7 wide at the lower margin in No. 16, to the tall conical pileus 4.2 cm. high by 2.6 in diameter at the base as in No. 11. There is no correlation between the shape of the pileus and the size and structure of the other parts. Some very tall specimens had campanulate pilei while others had the conical form, the same was true of the small specimens. The outer surface was always conspicuously reticulated, the edge of the ridges being acute and toothed. The ridges always extended to the pore at the apex. The pits enclosed by the ridges were in general deeper midway between the apex and the margin of the pileus and often became elongated in the vertical direction near the margin.

The size of the collar surrounding the pore was carefully noted since Fischer¹ stated that the absence of a collar is one of the chief characteristic marks of *D. phalloidea* var. *campanulata*. The large size of the collar is also mentioned by Morgan² in his description of *D. duplicata*. As a matter of fact this character is extremely variable. A complete series of forms was found, varying from those with absolutely no band surrounding the pore and with the gleba coming to its very margin, to those having a band 1.2 cm. wide from the edge of the pore to the free edge of the collar. The size of the pore varied from 0.3 cm. in diameter in No. 20 to 1.2 cm. in No. 13. Here again there was no correlation between the size of the collar and other characteristics, nor did the size of the collar depend upon the size of the pore. No. 6 has a broad, low pileus and no collar, while No. 3, also without the collar, has a relatively tall and conical pileus. No. 16 has the slightest trace of a collar. No. 1, which has the largest collar, has a large pileus with about an average relation between the height and diameter of the base.

The presence of a bit of gelatinous material, or a fragment of the volva on the apex of the pileus was mentioned by Cragin¹ in his description of *P. collaris*. It was found in one case where several plants were collected from the same mycelium that a complete series of variations in this character existed. This series of specimens varied from one with an open pore to one in which the membrane of the volva had ruptured at the side and one-third of the peridium was borne on the apex of the pileus. These specimens were gathered near the close of the season. It was afterwards noted that when the cool weather began to retard the development of the plants a greatly increased proportion of the specimens was found with part of the peridium covering the pileus.

There is no other part of the whole plant that shows as great variation in both size and structure as does the veil. The veil of a given specimen may vary with the age of the specimen when collected, or with the surrounding conditions. It was often observed that the veil expanded after the stipe had fully elongated. In other specimens the expansion of the veil was more rapid than the elongation of the stipe. In such cases the veil protruded from between the pileus and the volva as a large fold, which later straightens out and hangs free when the stipe is fully extended. When a specimen had been exposed to a dry atmosphere for a short time the veil became much shrunken. The measurements given in the table were taken from specimens gathered at about ten o'clock in the forenoon. Care was taken to measure the length of the veil when it was most fully expanded. While the

¹ Loc. cit.

² Loc. cit.

¹ Loc. cit.

outside conditions in which the plant is found, may modify the dimensions of the veil, there is no doubt that the actual amount of material which enters into it is as variable as any other feature of the plant.

The structure of the veil also varies extremely. In some cases it is a delicate pseudoparenchymatous membrane perforated with many rounded holes, in others it is a net composed of heavy bands and with large angular openings. In some cases the veil was found to be separated from its attachment to the stipe and was borne in the mouth of the ruptured volva. This may have been due to weakness in the attachment, the latter being so slight as to be insufficient to hold the weight of the veil, or the material of the volva may have been pressed so closely to the base of the stipe that the margin of the veil was held fast when the stipe elongated. Probably both factors contributed to bringing about this condition.

Beside the true reticulate pseudoparenchymatous veil I found, on many specimens, also a membranous hyphal veil. This veil hung between the true veil and the stipe. In the egg this structure is attached to the stipe just below the attachment of the reticulate veil. From this region it extends downward and is attached to the basal end of the stipe. When the stipe expands this veil is often torn loose from its attachment beneath the pileus in which case it appears as a lining of the volva. Very often, however, the break occurs somewhere between the upper attachment and the base of the stipe. In the latter case the upper part appears as a delicate membranous veil hanging beneath the true veil. If such a specimen is gathered before the true veil has expanded, or in cases where the true veil has been torn away the plant might readily be mistaken for a form allied to *D. Ravenelii* described by Burt.¹ Many specimens were preserved in which the true veil had only partly expanded and these show both veils very plainly. I find no reference to this inner membranous veil in the literature, but it is certainly a conspicuous feature in very many of the specimens collected in this region.

In numbers 4, 7, 8, 11, 14, and 18 we have examples of very long veiled types. These vary in height from 11.7 to 19 cm. The tallest, in size and general proportions, resembles the figure of Rau's *P. togatus*. From this the other specimens mentioned make a complete series from the tall to the very short stocky type. In No. 18 we have a short stout plant, in dimensions very much like *P. collaris* Cragin except that the veil is not torn from its attachment. One specimen, not mentioned in the table, is preserved and many others were found that did have the veil in the mouth of the volva. The one preserved is of much the same

¹ Loc. cit.

size and shape as No. 18 and doubtless represents the type of Cragin's *P. collaris*. Considering the whole series it will be seen that it embraces examples of every form of *Dictyophora* with the reticulate veil that has been so far reported from the United States.

The absence of a collar in some specimens, which has also been mentioned by Morgan¹ as a character of *P. duplicatus* (Bosc) suggests that these forms might be placed under Fischer's var. *campanulata*. Our specimens, however, all have high ridges on the pileus, and the pileus has a hyphal structure. Our specimens also differ from var. *typica* Fischer in this hyphal structure of the pileus. The bands of the veil in var. *typica* are cylindrical instead of flat as in our form. The presence of a netted instead of a membranous veil, distinguishes it from Fischer's var. *Farlowii* and the high toothed ridges on the pileus from his vars. *Guyanensis* and *Lauterbachii*.

Burt's argument in favor of retaining *D. duplicata* (Bosc) E. Fischer as a species seems conclusive.

The range of variability in the height of the plant must be taken as from 5.6 to 24 c. m. instead of from 15 to 24 c. m. The apical collar also, which seems to have been always present in the forms seen by Burt, must be regarded as varying in width from 0 to 1.2 c. m.

Madison, Wis., March 28, 1904.

A NEW HYPHOLOMA.

T. D. A. COCKERELL.

The following species, collected in New Mexico, seems to be new — in which opinion Professor Earle coincides. The description is as follows:

HYPHOLOMA PECOSENSE Cockerell n. sp. — Pileus $2\frac{1}{2}$ to nearly 4 cm. diam., slightly convex, middle of disc low-conical in some, margin nearly vertical, surface smooth, slightly inclined to be viscid; not at all strait, scaly or silky; creamy-white, more ochreous centrally, but always pallid; margin with remains of veil as light yellow irregular scales; gills pale purplish gray, inclined to be white at junction with stipe, their margins minutely white-furfuraceous; stipe $5\frac{1}{2}$ to nearly 9 cm. long, yellowish-white or very pale ochraceous, slightly striate from the very narrowly decurrent gills above, and also albofurfuraceous, otherwise smooth and shining; upper part hollow. Flesh mild, not bitter, not changing color on bruising or breaking. Spores purple-brown, quite dark, oval, 12μ long, 8 broad.

¹ Loc. cit.

Hab. — Pecos, New Mexico, June 1903, discovered by Dr. M. Grabham. Types in N. Y. Botanical Garden.

In Professor Earle's table of *Hypholoma* (Torreya, Feb. 1902) *H. flocculentum* McClatchie, has been omitted. It has a clayey-brown pileus, and appears to come near to *H. hirtosquamulosum* Peck.

SACCARDO: DE DIAGNOSTICA ET NOMENCLATURA MYCOLOGICA; ADMONITA QUAEDAM.

[Ann. Mycolog. 2:195-8. Mar. 1904.]

TRANSLATED BY FREDERIC E. CLEMENTS.

I.

Authors of new species, who describe them at length both morphologically and biologically, should append diagnoses of them in the usual form, in English, French, German or Italian, but above all, if it is possible, in Latin.

The scattered and often incomplete statements of essential characters are found only with difficulty in the long and frequently formless descriptions. In consequence, the diagnoses available for systematic compendia are often vitiated, wholly through the fault of the original authors.

II.

The host plants of fungi shall be designated by their Latin names, and not by vernacular names in English, Italian, etc., which are often of doubtful meaning.

It is of the utmost importance that every author should indicate the matrix, or host plant, particularly of parasitic fungi.

III.

The metric system alone shall be used in indicating measurements. When these are small, the micromillimeter should be employed. Fractions of millimeters, or other measurements, burdened with marks or signs, are ready sources of error.

IV.

For the sake of brevity, the sign \asymp , already in use since 1872, should be employed between figures indicating the extremes of length and width of microscopic organs, in place of the sign \times , $=$, $:$, which are made use of by mathematicians in another sense.

V.

When a specific name is transferred to another genus, the original author is cited in parenthesis (a practice earnestly to be commended), while the author of the new combination is also to be cited.

Example: Winter wrote *Sphaerella convexula* (Schw.), omitting the author of the combination. But this is a misleading citation, as the reader can make of it either *Sphaerella convexula* (Schw.) Wint., or *Sphaerella convexula* Wint.: both citations are erroneous, as the proper one is *Sphaerella convexula* (Schw.) Thüm.

VI.

Names of systematic divisions should be written uniformly in the feminine gender, as the word *plantae* is understood. This has the sanction of the best usage.

We often find in succession: *Euthallophyta*
Phycomycetes . . . *Mucoraceae*. These would be much more correctly written: *Euthallophytae* . . . *Phycomycetae*
. . . *Mucoraceae*.

VII.

The following terminology for the receptacles, spores, etc., of fungi is recommended, in order that there may be as much uniformity as possible.

Hymenomycetae: pileus (whatever the form); basidia; sterigmata; sporae; cystidia.

Gasteromycetae and *Myxomycetae*: peridium; gleba; capillitium; flocci; sporae.

Uredinaceae: sorus; teleutosorus; uredosorus; teleuto-sporae; mesosporae; uredosporae; pseudoperidium; aecidiosporae; caemosporae; epiteosporae.

Ustilaginaceae: sorus; sporae.

Phycomycetae: oogonia; oosporae; antheridia; sporangia; zygosporae; azygosporae; zoosporangia; zoosporae; conidiophora; conidia.

Pyrenomycetae and *Phymatosphaeriaceae*: stroma; perithecium; loculus; ascus; sporidia; paraphyses.

Discomycetae and *Tuberoideae*: ascoma; gleba; ascus; sporidia; paraphyses.

Schizomycetae: filamenta; baculi; cocci; endosporae; arthrospora.

Sphaeropsidaceae: stroma; pycnidium; basidia; sporulae.

Melanconiaceae: acervulus; basidia; conidia (not gonidia, which are altogether different, and belong to the Lichens).

Hyphomycetae: caespitulus; sporodochium; hyphae; conidiophora; conidia.

Obs. From the spore, in the broad sense, arises by germination a promycelium, which produces sporidiola (not sporidia, as many say).

VIII.

Fungi imperfecti, or *Deuteromycetae*, are to be cited and described along with their perfect stages (if these are clearly indicated). They should also be described separately in systematic works under their own name and with their form relatives, or at least cited here, with a reference to the place where they are described with the perfect forms.

The advantage of describing separately all the forms of imperfect fungi arises from the fact that we are entirely ignorant of the perfect stages to which the vast majority of this immense group belong, and that these forms are for the most part widely removed from the perfect stage, whence the great difficulty of determining whether one form or another has already been described (without a name) under its perfect stage. From this rule should be excepted species of the genus *Uredo*, which are most frequently associated with the teleutospore stage (*Uromyces*, *Puccinia*, etc.), with which alone they should be described. But species of *Aecidium*, *Epitea*, *Caeoma* and *Aecidiolum* are to be described or at least cited separately. Conidial stages of *Peronospora* and *Cystopus* are to be described but once, in connection with the perfect stages.

IX.

The names of fungi which do not show metagenesis should conform to the rules of nomenclature for other plants, but the metagenetic *Uredinaceae* and *Ascomycetae* should follow especial rules.

X.

The proper name of one of the *Uredinaceae* is that applied to the teleutospore stage, the secondary name is that given to one of the earlier stages (*Uredo*, *Epitea*, *Caeoma*, *Aecidium*, *Aecidiolum*). Moreover, when the name of an earlier stage of any species is found to have been published before the name of the correlated perfect stage, it is not permissible to transfer the name of the imperfect stage to the perfect one upon the plea of priority, unless the former is found to comprise the perfect stage also, as often happens in *Uredo*, with respect to species of *Uromyces*, *Puccinia*, *Coleosporium*, etc.

When we wish to transfer the name *Aecidium* to the teleutospore stage, as formerly permitted, we act directly contrary to

the facts. Of many examples, two will suffice. 1. When we change the name *Puccinia Caricis* Reb. (1804) to *P. Urticae* (Schum.) Lagerh., because the name of the aecidial stage (*Aecidium Urticae* Schum., 1803) is earlier, we make two misstatements, namely, that Schumacher knew and distinguished *Puccinia Caricis*, which he did not, and that this *Puccinia* grows upon *Urtica*, which nourishes no *Puccinia*. 2. When we change the name of the extremely common *Puccinia graminis* Pers. (1797) to *Puccinia poculiformis* (Jacq.) Wetts., because the name of the aecidium is prior (*Lycoperdon poculiforme* Jacq., 1783), we likewise make two false statements, namely, that Jacquin knew and distinguished *Puccinia graminis*, and that this assumes the form of a cup, a form which it does not exhibit.

XI.

As to the heteroecious species of *Uredinaceae* recently distinguished, the names proposed by Klebahn, Arthur, and others, based upon the two hosts, merit approval; with this condition, however, that the specific name be composed of not more than two words, and that the host of the teleutospore stage hold first place in the name, the host of the aecidium second place.

Thus: *Puccinia Pseudocyperi-Ribesii*, not *P. Ribesii-Pseudocyperi* Kleb. *Melampsora populina-Allii*, not *M. Allii-populina* Kleb.

XII.

What has been said of the nomenclature of *Uredinaceae* is valid for *Ascomycetae*.

Thus, for example, it is incorrect to write *Glomerella rufo-maculans* (Berk.) Schrenk & Spaulding, because the conidial stage is *Septoria (Gloeosporium) rufo-maculans* Berk. (1854), as Berkeley neither saw nor described the ascus-bearing stage. It is, however, correct to write *Glomerella fructigena* (Clinton) Sacc., for the ascophore is *Gnomoniopsis fructigena* Clinton 1902.

XIII.

Adjectival specific names should agree in gender with the name of the genus.

Hence the names *Glomerella cinctum* (B. & C.) Spauld. & Schr., *Glomerella piperatum* (E. & Ev.) Spauld. & Schr., *Puccinia hibisciatum* (Schw.) Kell., thus formed because the imperfect stages are of the neuter gender (*Gloeosporium* and *Aecidium*), are to be rejected, as well as for the reason that the authors cited within parentheses knew only the imperfect stage, which is altogether different from the perfect. The name *Nummularia nummularium* (Bull.) Keissl. Krypt. exsicc. Vindob. no. 516 (1900) is likewise to be rejected, both on account of tautology and the difference in gender.

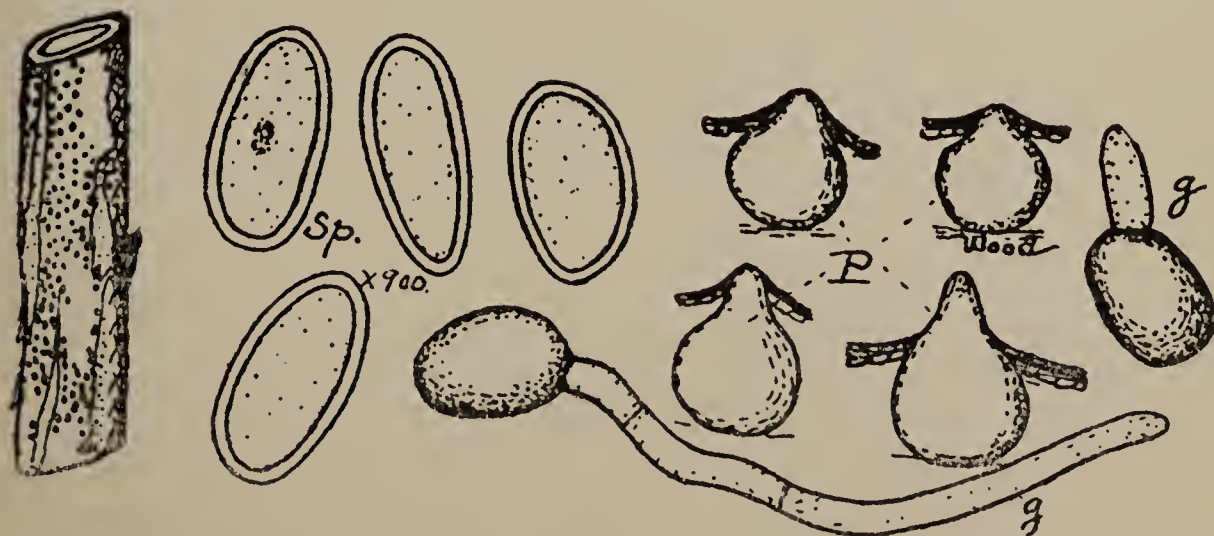
A NEW SPECIES OF NAEMOSPHERA.

W. A. KELLERMAN.

Inspecting some old stems of the common Prickly Lettuce—*Lactuca virosa* L. (or as some of the American botanists are calling the plant: *Lactuca scariola* var. *integrifolia*) a large quantity of a sphaeropsidaceous fungus was found. The stems of the host had been cut with the scythe late in the previous summer and lay exposed on a partly sodded hillside with southern exposure. In some cases the epidermis of the stem remained intact and then only the tips of barely protruding pycnidial beaks could be seen, but they were usually so abundant as to mark off quite large darkened areas, sometimes several inches in length. Where the epidermis was weathered away the beaks were fully exposed; sometimes the cortex also had disappeared and then the old pycnidia were seen seated directly on the woody portion of the stem.

An examination of the spores showed that they were of the *Sphaeropsis* type—being one-celled—and deeply colored. In that genus, however, the pycnidium is not beaked, and hence a closer affinity is shown to *Sphaeronaema*. Saccardo's first list of species of this genus (*Sylloge* Vol. 4) is divided into two sections, namely, *Eu-sphaeronaema* [*Sporulae subhyalinae*], and *Naemosphaera* [*Sporulae coloratae*]. Only two species were listed in the last section. In *Sylloge*, Vol. 10, *Naemosphaera* is listed as a genus and five additional species are enumerated. To this list must be added the species here described which may be named *Naemosphaera lactucicola*.

The accompanying figures illustrate the species in question. A twig is shown natural size in the Fig. Four pycnidia with indication of epidermis, slightly magnified are illustrated in Fig. (P.)



NAEMOSPHERA LACTUCICOLA Kellerm. To the left a stem of *Lactuca virosa* showing cluster of pycnidia; these removed and enlarged are shown at P, the fragments of epidermis indicated also. Four spores (sp.) are figured in outline, x 900; also 2 germinating spores (g).

Spores are shown in Fig. (Sp.). It was found that the spores readily germinated in water and still more freely in a decoction made from *Lactuca* stems, the germ tube appearing within 24 hours. A few germinated spores are shown in the Fig. at g.

The diagnosis of the species may be given as follows:

NÆMOSPHERA LACTUCICOLA Kellerm. n. sp. — Pycnidia beaked, clustered but distinct, occupying large areas, deeply seated, at maturity barely perforating the epidermis, black, brittle, globular to pyriform, 150-250 μ in diameter, ending in a rather broad beak of varying length but usually about one-half that of the pycnidium; spores brown with an olivaceous tint, broadly oval or oblong, not septate, 18-24 x 7-12 μ .

On old stems of *Lactuca virosa*, Columbus, Ohio. April 15, 1904. (Kellerman, 4208.)

MINOR MYCOLOGICAL NOTES. IV.

W. A. KELLERMAN.

UNCINULA PARVULA. — When examining herbarium specimens of various species of *Uncinula* recently, it was found that my copy of "No. 149, *Uncinula polychaeta* B. & C., A. B. Seymour & F. S. Earle, on *Celtis occidentalis*, Starkville, Miss." contained both *Uncinula polychaeta* and *Uncinula parvula*. These were mostly on separate leaves but in one case both species grew intermixed on the same leaf. Of S. M. Tracy's "*Plants of the Gulf States*, No. 8273, *Uncinula polychaeta* B. & C., on *Celtis occidentalis*, Weatherford, Texas, Oct. 20, 1902," the copy belonging to the Carnegie Museum, Pittsburg, [Acc. No. 2263] is not as named, but exclusively *Uncinula parvula* Cke. & Peck.

MYCOLOGICAL FLORA OF CEDAR POINT. — This locality is a sand spit opposite Sandusky Bay, on the Southern shore of Lake Erie. Its length is about six or seven miles, mostly only 500 to 2,000 feet in width except the upper (outermost) portion which for the distance of nearly a mile is from 3,000 to 4,000 feet across. In this widened apex are a couple of swales and most of the season ponds remain of considerable area. The sandy soil supports no sod generally, but a herbaceous flora of perhaps 300 species grows with some luxuriance. The bog and aquatic plants are abundant on the Bay side of the spit where the outline is very irregular, one or two of the recesses or bayous occupying considerable area. The trees are rather abundant throughout — the Cottonwood, Willows and Oaks (especially the black, and shingle Oaks) are abundant and many other species occur in lesser quantity. The mycologic flora is more abundant than would be expected perhaps. The following species have been collected.

- Albugo candidus* (Pers.) Ktze. on *Bursa bursa-pastoris* and *Lepidium virginicum*.
Bacillus amylovorus (Burr.) De Toni on *Cydonia vulgaris* (cult.).
Cercospora clavata (Ger.) Peck on *Asclepias syriaca*.
Cercospora helianthi C. & E. on *Helianthus hirsutus*.
Cercospora menispermii Ell. & Holw. on *Menispermum canadense*.
Cercospora murina E. & K. on *Viola obliqua*.
Cercospora tuberosa Ell. & Kell. on *Apios tuberosa*.
Claviceps purpurea (Fr.) Tul. on *Anemophila arenaria*.
Coleosporium campanulæ (Pers.) Lev. on *Campanula americana*.
Collybia dryophila Bull. on rotten wood.
Collybia platyphylla Fr. on rotten wood.
Entyloma menispermii Farl. & Treal. on *Menispermum canadense*.
Erysiphe cichoriacearum DC. on *Parietaria pennsylvanica*.
Erysiphe polygoni DC. on *Onagra biennis*.
Gloeosporium nervisequum (Fuckl.) Sacc. on *Platanus occidentalis*.
Gymnosporangium sp.—*Roestelia* sp.? on *Amelanchier canadensis*.
Helotium citrinum (Hedw.) Fr. on rotten wood.
Lachnella chlorascens (Schw) Morg. on rotten wood.
Lentinus sulcatus Berk. on old wood.
Marssonina toxicodendri (E. & M.) Sacc. on *Rhus toxicodendron*.
Microsphaera alni (Wallr.) Salmon on *Euonymus atropurpurea*, *Gleditsia triacanthos*, and *Apios tuberosa*.
Morchella esculenta (L.) Pers. on ground.
Peronospora parasitica (Pers.) DeBy. on *Lepidium virginicum*.
Phoma uvicola B. et C. on *Vitis vulpina*.
Phyllachora graminis (Pers.) Fckl. on *Hystrix hystrix*.
Phyllosticta iridis E. & E. on *Iris versicolor*.
Phyllosticta labruscæ Thüm. on *Vitis vulpina*.
Phyllosticta palustris Ell. & Dearness on *Stachys palustris*.
Phyllosticta phaseolina Sacc. on *Strophostyles helvolus* (L.) Britt.
Plasmopara australis (Speg.) Humph. on *Sicyos angulatus*.
Plasmopara viticola (B. & Curt.) Berl. & DeT. on *Vitis vulpina*.
Pleurotus sapidus Kalchb. on Willow log.
Plowrightia morbosa (Schw.) Sacc. on *Prunus virginiana*.
Podosphæra oxyacanthæ (DC.) DeBy. on *Prunus virginiana*.
Polyporus arcularius (Batch.) Fr. on rotten sticks.
Polyporus brumalis (Pers.) Fr. on old sticks.
Polyporus gilvus Schw. on rotten wood.
Polyporus versicolor L. on old stumps.
Polystictus cinnabarina (Jacq.) Fr. on old log.
Puccinia caricina DC. on *Carex laxiflora*.
Puccinia glechomatis DC. on *Agastache nepetoides*.
Puccinia menthæ Pers. on *Mentha canadensis*, *Monarda fistulosa*.
Puccinia osmorrhizæ C. et P. on *Washingtonia longistylis*.
Puccinia panici Dietel on *Panicum virgatum*.
Puccinia seymouriae Burr. on *Afzelia macrophylla*.
Puccinia taraxaci Plow. on *Taraxacum*.
Puccinia xanthii Schw. on *Xanthium*.
Pucciniastrum agrimoniae (DC.) Diet. on *Agrimonia hirsuta*.
Ramularia celastri Ell. & Martin on *Celastrus scandens*.
Ramularia variabilis Fckl. on *Verbascum thapsus*.
Rhizobium mutabile, in root Tubercles of several leguminous plants.
Schizophyllum alnea (L.) Schroet. on old wood.
Sepedonium chrysospermum (Bull.) Fr. on rotten wood.
Septoria oenotheræ (Lasch.) West. on *Onagra biennis*.
Septoria scrophulariæ Pk. on *Scrophularia marylandica*.
Septoria verbascicola B. & C. on *Verbascum blattaria*.
Sphaerotheca phytophila K. & Sw. on *Celtis occidentalis*.
Stereum candidum Schw. on bark *Juniperus virginiana*.

Stereum disciforme DC. on old wood.
 Stereum versicolor (Schw.) Fr. on rotten wood.
 Tremella mesenterica Retz on rotten wood.
 Uromyces medicaginis-falcata (DC.) Wint. on Medicago lupulina.
 Xylaria digitata (L.) Grev. on Ash log.
 Xylaria polymorpha (Pers.) Grev. on rotten wood.

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(To be continued.)

ELEMENTARY MYCOLOGY.

(Continued.)

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This second installment of a brief treatise on fungi for beginners and general readers continues the *General Outline of Plant Life* and subsequent paragraphs will deal more particularly with the systematic classification of plants, to be followed by a discussion of the groups of fungi.

HYPHÆ. — The minute structure of a fungus, or in fact that of any other plant, can not be understood without the aid of a microscope. If Bacteria are examined under a high power they will be found to consist of a body nearly transparent and having forms shown in the figures. Fig. 1 shows the circular form of Micrococcus; a Bacillus has the form indicated in Fig. 2, and a Spirillum like that of Fig. 3. Peculiar shapes and varying sizes will be shown when the Yeast-plant is examined, Fig. 4.



Figs. 1-4 Bacteria and Yeast. Fig. 1, Micrococcus; fig. 2, Bacillus; fig. 3, Spirillum; fig. 4, the Yeast plant. These and the subsequent figures are mere diagrams or outline sketches adapted from accurate figures in standard works or constructed from specimens, giving only such details as seem desirable in connection with the present purpose.

A portion of a grape leaf in which the Grape-Mildew is growing is shown in Fig. 5; the various roundish or angular cells of which the tissue of the leaf is composed and their protoplasmic granular contents are represented. There are shown also in the figure elongated or tubular cells, that ramify between the leaf-cells, and at one point they are seen to emerge from the leaf-pore or stomate; then they branch more or less profusely and finally bear roundish or oval bodies which are called the *co-nid'-i-a*, or *spores* of the fungus. All cells of which any fungus is composed, are called *hy'-phae*. A hypha may be very small, consisting of a single cell and that scarcely elongated. But in all except the simplest fungi the hyphæ are usually much elongated and they often branch, sometimes very profusely. Each hypha may be a single

cell — a tubular structure (so far as the wall is concerned) with one continuous cavity. In other cases cross partitions are devel-

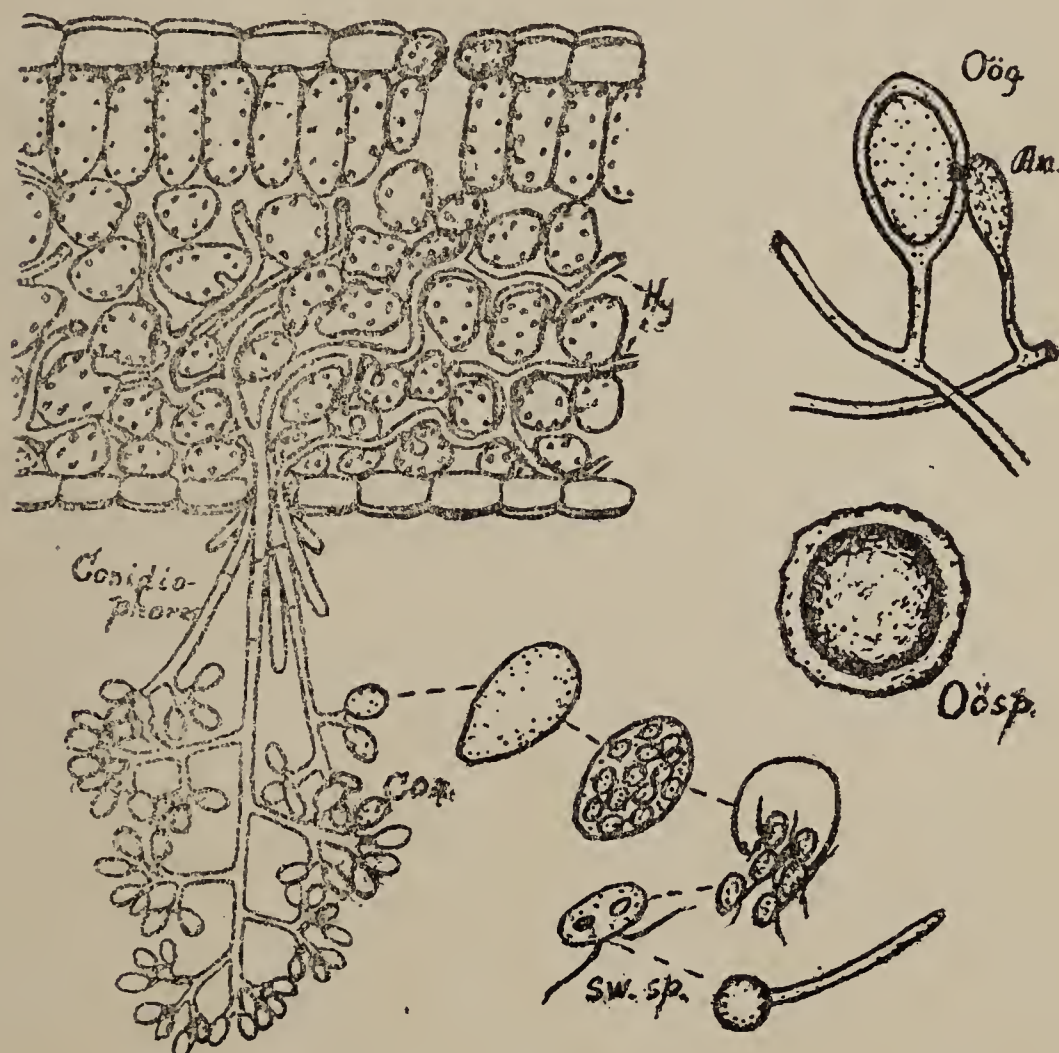


Fig. 5. Grape Mildew (*Plasmopara viticola*). A section of a grape leaf is shown between the cells of which the hyphae ramify and from which they draw nourishment. The hyphae emerge from a stomate in the lower surface to bear abundant conidial spores; these produce swarm-spores which grow into new plants. The two organs (oogonium and antheridium, Oög. & An.) are shown to the right above which produce the sexual spore (Oospore, Oösp.).

oped at closer or more distant points, and these septa divide the cavity into separate compartments; we then say the hypha is multi-cellular. The increase in the size of the cells in fungi and in other plants and their repeated multiplication, may result in the formation of tissue of lesser or greater extent, ultimately of simpler or more complex structure, and possibly manifold functions; also marked division of labor may ensue.

CELL MULTIPLICATION. — Unicellular organisms (plants and animals) grow only by increase in size of the single cell — a division (as in the multicellular forms) into two, these again dividing and so on, never taking place; however, it must be remembered that multiplication of individuals occurs — so-called *fission*, *i. e.*, division into two equal parts. Such unicellular individuals, while extremely numerous, comprise only a small fraction of the total number of species in the organic world. They are small forms,

the great majority of them being microscopic. Reference has already been made to such examples as the microscopic Bacteria and Yeasts; correspondingly simple unicellular animals are the Amoebae, the Infusoria, and in fact all those organisms belonging to the group sometimes called the Pro-tis'-ta. But most of our well known common plants (and animals) consist of more than one cell; they are *multicellular organisms*. Yet in their earliest stage of development the plants (and animals) consisted of a single cell—for the tiny mass of protoplasm, derived from a parent mass, is the incipient cell of the individual. The biological unit, as the cell may be called, as understood to-day is not a simple homogeneous mass of matter. On the contrary, it is very complex in structure and possesses varied functions; but of these phases our knowledge is as yet very incomplete. The branch of botany that deals with the cell in its various aspects is called *Cy-tol'-o-gy*, and a large mass of literature touching this subject has already appeared. While we can not here enter even into the elements of cytology, it is well to remark that the process of division of a single cell into two cells is very complicated. In the cases best understood, the initial activity is seen in the nucleus. This is a dense, well defined, but highly complex portion of the protoplasm and ordinarily of easy recognition upon microscopic examination. Immediately after the nuclear division processes take place—for illustration of which the larger manuals of botany must be consulted—the division of the *cy'-to-plasm* follows—this term being used to designate the remaining portion of the protoplasm. Simultaneously with the division of the cytoplasm or immediately thereafter, a cell-wall, or partition wall of cellulose, is formed which completes the division of the so-called mother cell into two daughter cells. Suffice it to add that by such repeated cell divisions, the tissue of plants is built up. Naturally the cells in the early stages of development and growth are quite uniform; but this homogeneity is retained only in their *embryonic stage*—as this phase has been designated. They take on different shapes presently, and respond to the demands of a complicated organism by assuming also varied and peculiar functions.

CONTINUITY OF PROTOPLASM. — When the early plant anatomists made sections of leaf, stem and other parts, the conspicuous cavities separated and bounded by partition walls received their first attention. These they called *cells*. But the modern conception of a cell is very different. It is regarded as the living active nearly colorless *protoplasm*, and this it is which secretes or builds up the wall. The wall then is not an essential part of a living cell, though in fact being generally developed in plant organisms and forming the stable or firm, often dense and resistant, plant body. The wall consists of cellulose with which (as in all organic matter) are indissolubly united some

water and mineral constituents. The chemical elements in the cellulose are Carbon, Hydrogen and Oxygen. The important elements in protoplasm are these three — Carbon, Hydrogen and Oxygen — and in addition also *Nitrogen*. The presence of the latter is very significant; all nitrogenous bodies are, potentially at least, active. The non nitrogenous on the contrary are passive. The nervous tissue, the glands, the muscles, contain nitrogen — as does also powder and dynamite; the bones and the ligaments are non-nitrogenous. Protoplasm is a highly nitrogenous substance; it does all the work involved in manufacturing food and carrying on the various processes in nutrition, growth and reproduction. In a unicellular plant, with or without a cell wall, there is but one mass of protoplasm. But those plants in which the cells divide into two, these dividing again and so on, have presently a multitude of protoplasmic masses — each cell cavity being filled with the active living substance. It is interesting to note that in a few groups of the lower plants, the nucleus divides, and this is repeated, so that finally many nuclei may be present in the cytoplasm, yet no cellulose walls are developed separating these as is the case in the higher plants. It would seem that the essential process of cell-division had taken place and that such plants (*coen'-o-cytes* they have been called) might be said to be multicellular — though not in exactly the same sense in which the term is used in reference to the higher plants. In the uni-nucleate or the multinucleate mass of protoplasm there could well be a more or less free play of the resident energy — the whole as one individual. Can such a conception be retained when the higher multicellular plants are considered? Without doubt, because it has been found that notwithstanding the existence of isolating or surrounding walls, the individual masses of protoplasm, the “cells,” are in the closest sympathy; at least they maintain actual connections with each other. Minute protoplasmic threads penetrate these walls and it is this fact that is alluded to in the phrase “continuity of protoplasm.” We can readily understand then that the entire plant — whether tiny herb, spreading shrub, or giant tree — is in a real sense an individual, these several anatomical elements which are called cells being — not isolated like so many cemented bricks or stones in a wall, but as intimately bound together as is the case in a perfect machine; we can also with equal propriety suggest the likeness to the sympathetic organs of the human body. Work then can be co-ordinated in the highest plant — those in which the tissues are differentiated to a marked degree. Some of the tissues — composed of specially differentiated cells — do one kind of work, others perform other functions. Thus the varied processes of absorption of food materials the decomposition of carbonic dioxide and water, the formation of carbohydrates and other organic substances, digestion, assimilation and respiration are carried on, each by tissues spe-

cially differentiated for the particular work. The "division of labor," is as marked as in animals of complex structure. It is, in fact, as pronounced and as advantageous as that witnessed in the highest stages of human civilization.

TISSUE. — The differentiation of cells and tissues referred to in the previous paragraph, is illustrated in our common plants — the herbs, shrubs, and trees. There is, for example, an epidermal system of tissues — the epidermis itself consisting of a compact layer of cells with their outermost walls much thickened, usually also cuticularized, affording to the delicate tissue beneath efficient protection against the elements or other untoward exigencies; between two specially modified (so-called *guard-cells*) a pore, or *stomate*, is formed; the stomates, though extremely small, number hundreds to the square inch of leaf-surface and through these ample entrance is afforded for carbonic dioxide, as well as free passage to oxygen and watery vapor — without which the various processes in nutrition and growth could not take place. Epidermal cells may develop in the form of hairs or scales — also protecting devices. There is also a system of woody tissue — either isolated strands as in the herbaceous stems, or a coalesced mass with cells much thickened and strongly lignified as in the shrubs and trees. In all of these plants, many of them of great size, the mechanical tissues are abundantly developed — essential for support of the various parts and the maintenance of the plant-form. Equally various and complex are the tissues and cells specially concerned in nutritive and reproductive processes.

MYCELIUM. — If we pass from the common Flowering plants and Ferns to the next lower group, namely, the Mosses and Liverworts, less differentiation in the tissue is seen. There is no specially modified epidermis; there are no woody strands in the scale-like leaves — none even in the stems of the Mosses; and most Liverworts have no stems. There is, in short, less heterogeneity in the cells composing the plant. If we turn to still lower plants, the group of *Thal'-lo-phytes*, which includes the Lichens, Fungi, Algae, and Slime Moulds, less complexity in tissue will be found; instead of great heterogeneity, marked homogeneity prevails. In some of the highest representatives of this great group of plants, as the Lichens, the Toadstools, the large "sea-weeds" (marine algae), there is a comparatively large and more or less complex form of plant body. Even the interior structure is found to be somewhat intricate in these plants; but yet the cells forming the more or less compact tissue are quite similar throughout — they have not become noticeably differentiated, have not assumed varied forms, as is seen in the tissues of a Fern or a Rose. The lowest plants exhibit the greater simplicity — a single cell may constitute the entire plant though this in a few cases becomes much extended and variously branched. The many-celled *Thallophytes* may develop a tangled mass or thick felt of

tissue; they may assume such forms as the tree-like Sea-weeds exhibit; still another direction in which the differentiation proceeds is shown in the Toadstools which have an underground part simulating a root, an erect cylindrical stem and umbrella-like cap. In all these cases the *hyphae* can readily be detected as the units or anatomical components of the plant body. To such a mass of hyphae the term *My-ce'-li-um* has been applied. The Mycelium may be sparse and loose, or it may be abundant, flocculent, felt-like, or even compacted into more or less dense tissue. The difference in manner of development as well as structure of the compact mycelium — which is sometimes called *pseudo-par-en-chy-ma* — and the true or ordinary tissue can be easily detected. In case of true tissue, such as found in all the common higher plants, a single cell divides into two, these two divide and so the process continues — the resultant cells quickly growing to the normal size — and so an extended mass of cells is formed, which are coherent and more or less firm constituting what is called true tissue; the word *par-en'-chy-ma* is sometimes applied to such a structure. The cells may now assume different shapes in different parts of the mass — in other words, differentiation to greater or less extent may take place. But in case of mycelium a single hypha only, single or with subsequently formed septa, may be present; but even if the hyphae are numerous and the component cells abundant and more or less compacted, they may, under the microscope, be readily unraveled and thus the origin of the false tissue (*pseu'-do-par-en'-chy-ma*) demonstrated.

(To be Continued.)

NEW GENERA OF FUNGI PUBLISHED SINCE THE YEAR 1900, WITH CITATION AND ORIGINAL DESCRIPTIONS.

COMPILED BY W. A. KELLERMAN AND P. L. RICKER.

The widely scattered, oftentimes practically inaccessible literature containing NEW GENERA OF FUNGI has suggested the desirability of collecting the descriptions and reprinting them *verbatim*, with full *citations*, in one periodical for the convenience of the large and rapidly growing number of American workers. The first installment is herewith presented, covering the period 1901-1903, and will be completed in the following No. of the Journal.

At intervals of a few months *supplemental installments* will be given and will, like this, be printed also as SEPARATES — the alternate pages being left blank.

A *card index* can be readily made, if desired, which of course would be useful to workers, and indispensable in the large scientific libraries.

The descriptions of new genera constitute the bulk of the compilation, but *new generic names* are likewise included; we give also all names and diagnoses of *larger groups*, as sections, families, etc. In fact, no new group names or descriptions are to be omitted, and the Slime Moulds, Fission Fungi, and Lichens are included. This, together with the complete INDEX TO NORTH AMERICAN MYCOLOGY by the senior author, where are given full citations for *species*, *hosts*, etc., should furnish the student and the working mycologist a ready and perfect guide, as well as compendium of considerable usefulness.

The names are arranged *alphabetically* for convenient reference and placed under the commonly accepted large groups named below. The genera of the Laboulbeniaceæ are separated from the Ascomycetæ; so also the Aecidiomycetæ—comprising the Smuts and Rusts—are given as a separate group. The Lichens are not listed separately but placed where they structurally belong with the Fungi proper. The “imperfect fungi” are listed as the Deuteromycetæ. The sequence in the list is as follows:

- I. Myxomycetæ.
- II. Schizomycetæ.
- III. Phycomycetæ.
- IV. Ascomycetæ.
- V. Laboulbeniineæ.
- VI. Aecidiomycetæ.
- VII. Basidiomycetæ.
- VIII. Deuteromycetæ.

The abbreviations *n. n.*, *n. g.*, *n. subg.*, *n. sec.*, *n. fam.*, etc., will be used instead of the full words *new name*, etc. The Family or special group to which the new genus, etc., belongs, will be reproduced when possible *in the form given by the author*. The citation includes the Full name of the volume or periodical, with date given on title page of the Volume, Number, Part, Heft, etc. The common American mode of citation of the volume, number of the page and date is followed, according with Library rules except that dates are indicated in an unambiguous manner.

For still greater convenience the name of the *large group* is given *immediately above each description*. This plan will be appreciated when the compilation becomes very much extended. In case the Separates are cut up and the paragraphs attached to *library cards* this group designation will prove indispensable. Since the date is always given in the first or second line, it will be possible, when desired, to arrange the names in a chronological order.

All authors of new genera or other groups of fungi and those who propose new names are earnestly requested—when the periodical is not taken by practically all libraries and botanists—

to see that the Number containing the matter in question, is promptly placed in our hands.

The kindness will be appreciated if our attention is at once called by authors to their volumes and independent pamphlets or brochures in which new names occur. Equally solicitous are the compilers to have the attention called to any accidental omissions or for a time neglected items.

[Myxomycetæ]

I. MYXOMYCETÆ.

HEIMERLIA v. Höhnelt n. g. Echinosteliceæ. Annales Mycologici, 1:391. 30 Sept. 1903.

"Planta candida. Peridium globosum vel pyriforme, stipitatum. Stipes corneus, subulatus, in columellam intra peridium subtiliter productus. Tunica tenuissima, homogenea, structura deficiente. Capillitium nullum. Sporæ (nondum bene evolutæ) hyalinae.

"Heimerlia hyalina n. sp.

"*Heimerlia* ist eine interessante Form, welche sich unmittelbar an *Echinostelium minutum* de Bary anschliesst. Diese Art, welche in der Literatur als bisher nur einmal von Anton de Bary bei Frankfurt am Main gefunden angeführt wird, scheint in der Wiener Gegend nicht selten zu sein. H. Zukal fand sie im Winter 1894-95 in einer Zimmerkultur; im September 1896 traf sie Ch. Lippert bei Alland im Wienerwalde, und ich fand sie 1901 im Halterthale bei Hütteldorf im Wienerwalde.

"*Echinostelium* hat einen dünnwandigen hohlen Stiel, der mit kerniger Masse ausgefüllt ist, und ein aus 2-3 Hauptästen mit kurzen einfachen Seitenzweigen versehenes, hyalines Capillitium, das an der Spitze des Stieles entspringt. Im Ubrigen entsprechen sich beide Gattungen vollkommen. Die dünnfädige, steife, nur an der Spitze manchmal umgebogene Columella von *Heimerlia* kann als reduziertes Capillitium betrachtet werden. Wollte man dem Umstande, dass hier das Capillitium als Columella entwickelt ist, eine grössere Bedeutung beilegen, so müsste man die Gattung in eine eigene Familie, die *Heimerliaceae* zu nennen wäre, bringen, die am Beginne der Reihe zu stellen wäre, welche nach oben hin zu den *Stemonitaceae* aufsteigt. *Heimerlia* ist offenbar die einfachste hierher gehörige Form."

HEIMERLIACEÆ v. Höhnelt n. fam. Myxomycetæ. Annales Mycologici, 1:392. 30 Sept. 1903.

See under *Heimerlia*.

II. SCHIZOMYCETAE.

III. PHYCOMYCETAE.

[Phycomycetæ.]

ABSIDEAE Vuillemin n. ser. Mucoraceae. Comptes Rendus des Séances de l'Académie des Sciences, 136:516. 23 Feb. 1903.

"Nous sommes amenés à circonscrire, dans la tribu des Mucorées, une série des Absidiées, caractérisée par l'apophyse en entonnoir rigide, la columelle flasque s'affaissant dans l'apophyse et les spores petites. D'après la complication croissante de l'appareil cystophore, nous y distinguerons cinq genres:

"1. Proabsidia (P. Saccardoi). 2. Lichtheimia (L. corymbifera, Regnieri). 3. Mycocladius (M. verticillatus). 4. Tieghemella (T. dubia, Orchidis, repens). 5. Absidia (A. septata, capillata, reflexa)."

[Phycomycetæ.]

ASTEROPHLYCTIS Petersen n. g. Chytridineæ. Journal de Botanique, 17-218. June-July 1903.

"Asterophlyctis sarcoptoides n. gen. et n. sp.; fig. 3-10. Le thalle de cette espèce comprend, comme chez le *Rhizoclosmatium*, trois parties: le sporange, les rhizoïdes et la partie subsporangiale, un élargissement de la base des rhizoïdes. Le sporange adulte est d'une forme très variable, en général à peu près hémisphérique:

"1. (Fig. 5, 6, 8, 9, 10) avec des parois minces plus ou moins lisses; tantôt irrégulièrement arrondis ou anguleux, tantôt étoilés;

"2. (Fig. 4) avec des parois épaisses réfringentes: étoilés ou épineux, avec des épines plus ou moins massives..

"Les sporanges ont par ex.: $26 \times 18 \mu$; $21 \times 14 \mu$; $28 \times 25 \mu$ en diam.; les épines du second type ont souvent $4 \times 9 \mu$ de longueur. Dans les sporanges du premier type, le protoplasma s'étend jusqu'à l'extrémité des protubérances. Les individus arrondis du premier type ressemblent au *Rhizoclosmatium*, mais ils s'en distinguent du reste facilement, par exemple par leur partie subsporangiale souvent complètement vide. Les épines des sporanges du second type sont souvent ramifiées, plus ou moins noueuses, irrégulières. La partie subsporangiale et le mycélium, dont la ramification ressemble à celle du *Rhizoclosmatium*, ont comme cette espèce des parois minces, mais au contraire un protoplasma éphémère. Les zoospores, de $2-3 \mu$ de diamètre, uniciliées, avec un nucléole distinct, sortent par un orifice près de la partie subsporangiale ou par cette partie elle-même. En sortant elles sont unies par leurs flagella. Elles demeurent quelques minutes unies en s'efforçant de se dégager les unes des autres; puis elles se dégagent une à une et nagent très vite, en traînant leur flagellum. Elles germent probablement, comme chez le *Rhizoclosmatium*, immédiatement après leur fixation. La zoospore émet en germant la partie subsporangiale et les rhizoïdes et devient elle-même le sporange. Parfois on voit les zoospores dégagées les unes des autres nageant dans le sporange; il en est ainsi quand l'orifice ne se forme pas à temps. Si le sporange reste continuellement fermé, les zoospores meurent. Je n'ai pas observé de spores immobiles; vraisemblablement elles naissent des sporanges du second type (fig. 9)."

[Phycomycetæ.]

COENOMYCES Deckenbach n. g. Coenomycetes. Flora oder Allgemeine Botanische Zeitung, 92:265. 25 May 1903.

"Zoosporangiis piriformibus, protoplasmate luteo-aurantiaco farctis, basi apiculatis $15-22\mu$ diam., apice filamentorum myceliorum sitis, in collum cylindraceum usque ad $120-150\mu$ longum attenuatis extramatrixlibus. Zoosporis ellipsoideis vel piriformibus, postice cilio unico recto praeditis, 1.5μ luteo-aureis; filamentis mycelicis septatis alteris extramatrixlibus in muco Nemalionis immersis ramosissimis, alteris intramatrixlibus inter cellulas et vaginam Calotrichum repentibus irregularibus $1.5-2\mu$ crassis."

[Phycomycetæ.]

COENOMYCETES Deckenbach n. div. Flora oder Allgemeine Botanische Zeitung, 92:265. 25 May 1903.

"Fungi filamentis mycelicis *septatis*; fructificationes *zoosporifera*."

"Jedoch lässt die Abwesenheit eines septierten Mycels bei den Chytridineen, ihre strenge Einzelligkeit, sogar die vollkommene Reduktion ihres Mycels in den meisten Fällen, nicht zu, diesen Pilz den Chytridineen zuzuzählen, und veranlassen mich, ihn in eine gesonderte Abteilung auszuscheiden, welche sich so von den *Phycomyceten* wie von den *Eumyceten* unterscheidet."

[Phycomycetæ.]

CUNNINGHAMELLA Matruchot n. g. Mucoraceæ. Annales Mycologici, 1:46. Jan. 1903.

"Le champignon dont il va être question dans le présent travail [*Choanephora cunninghamina*] offre de grandes affinités avec les *Choanephora*. Toutefois il en diffère assez pour qu'il soit nécessaire d'en faire un genre distinct. Je dénomme ce champignon *Cunninghamella africana*. Le nom générique est créé en l'honneur du distingué mycologue des Indes anglaises; le nom d'espèce rappellera l'origine africaine du champignon."

[Phycomycetæ]

GLOMERULA Bainier n. g. Mucoraceæ. Bulletin de la Société Mycologique de France, 19:154. 30 April 1903.

"Glomerula repens nov. gen., sp. nov.

"Le *Glomerula repens* se cultive aisément sur la bouillie épaisse de farine de lin, sur le bois de réglisse, etc., etc. Les filaments aériens sont très ramifiés et forment une épaisse couche au-dessus du substratum. Chaque branche dressée donne un sporange terminal souvent plus volumineux et au-dessous un verticille de 3 à 8 filaments secondaires terminés chacun également par un sporange. Ces 3 ou 8 filaments donnent naissance à une petite distance au-dessous de leur sporange à un verticille de 3 à 5 nouveaux filaments sporangifères. Quelques filaments du mycélium aérien envoient leur extrémité jusqu'au contact de la

paroi du vase où se fait la culture et à ce point il se produit un pinceau de crampons ramifiés qui se fixent et servent de point d'appui à de courtes branches ramifiées en verticelles composés et surmontées de sporanges très petits, très nombreux et très rapprochés les uns des autres au point de former de petites masses hémisphériques presque sessiles. Le sporange du *Glomerula* est sphérique, incolore, mais il prend en vieillissant une teinte terre de Sienne bien plus accusée dans les sporanges groupés des filaments stolonifères. La membrane qui le recouvre est complètement hérissée d'assez longues aiguilles d'oxalate de chaux et diffuente à la maturité, ne laissant qu'une collerette rabattue. Les spores sont rondes et lisses.

"La columelle est de forme un peu variable, hémisphérique, cylindrio-conique, ovoïde et même quelque fois étranglée dans sa partie moyenne. Elle s'insère sur l'extrémité assez brusquement dilatée du support. Ce support présente des cloisons. Il en existe une à une distance variable au-dessous des sporanges et ordinairement rapprochées du verticelle qui est en dessous. La plupart du temps incolore, il se teinte légèrement lorsque la plante vieillit, mais c'est dans les fructifications groupées sur crampons qu'il prend une couleur de terre de Sienne bien plus nette.

"Si on vient à cultiver le *Glomerula repens* sur une goutte de décoction de pruneaux, dans une boîte en plâtre humide, on obtient de gros articles arrondis de ferment sphérique et des chlamydospores aériennes et mycéliennes.

"Ces chlamydospores sont semblables. Leur membrane extérieure est épaisse, légèrement jaunâtre et couverte d'aspérités. On voit à l'intérieur un nombre plus ou moins grand de globules huileux, jaunâtres, accolés les uns aux autres au centre et entourés d'un liquide légèrement teinté de bleuâtre. Les chlamydospores mycéliennes immergées sont beaucoup plus nombreuses."

[Phycomycetæ.]

LICHTHEIMIA Vuillemin n. g. [Type, *Mucor corymbifer*.] Comptes Rendus des Séances de l'Académie des Sciences, 136:515. 23 Fb. 1903.

"Les caractères du sporocyste communs aux genres *Proabsidia*, *Tieghemella* et *Absidia* se retrouvent chez le *Mycocladius verticillatus* Beauverie et chez le *Mucor corymbifer*. Le premier a des stolons indéfiniment rampants sans rhizoïdes; le second n'a ni stolons ni rhizoïdes, mais il très voisin des *Tieghemella*, notamment du *T. dubia* par son mode de ramification. Souvent l'axe principal s'incline vers le sol et les pédicelles secondaires, rejetés du côté de la convexité, se groupent en bouquets comme chez les *Absidia*. Le *Mucor corymbifer* a donc des affinités plus positives avec le genre *Absidia* qu'avec le genre *Mucor* et, ne pouvant le rattacher directement au premier, nous croyons nécessaire d'en

faire le type d'un nouveau genre. Nous le nommerons *Lichtheimia* en l'honneur du professeur Lichtheim de Berne, à qui nous devons sa découverte."

[Phycomycetæ.]

MACROCHYTRIUM v. Minden n. g. Saprolegniaceæ. Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, 2 Abt. 8:824. 30 June 1902.

"Noch viel ungewisser als bei *Blastocladia* bleibt man sich hinsichtlich der Stellung einer neuen, von mir aufgefundenen Gattung, die als *Macrochytrium botrytioides* bezeichnet sein möge.

"Diese Form tauchte ganz plötzlich in meinen Kulturgefässen auf. Zunächst fällt bei grösseren Exemplaren wohl die Ähnlichkeit mit der Alge *Botrydium* in die Augen; im Einzelnen ergeben sich freilich mancherlei Unterschiede.

"Die immer allein vorhandenen, meist breit ellipsoidischen, kugeligen Sporangien sind mit blossen Auge deutlich erkennbar. Es werden zahllose einzellige Sporen vom Chytridineencharakter in ihnen gebildet. Die Oeffnung geschieht mit einem Deckel, der charnierartig an einer Seite befestigt bleibt und aufklappt, wie der Deckel eines Kruges. Der Vorgang des Oeffnens und Ausschwärmens erregt, weil hier alles in grössten Massverhältnissen erfolgt, ungemeines Interesse.

"Eigentümlich ist, dass das Sporangium, wie es zunächst aussieht, nicht das organische Ende der Hauptsache darstellt, sondern dass am jugendlichen Hauptstamm, der mit zahlreichen Rhizoiden in Substrat verankert ist, unterhalb der Spitze, die dann ihr Wachstum einstellt und später als ein knopfförmiger oder spitzlicher Vorsprung erscheint, ein Auswuchs auftritt, der sich dann zum Sporangium umgestaltet.

"Am meisten nähert sich diese sehr charakteristische Form wohl den Chytridineen, wenn gleich die reiche Entwicklung des Mycel und vor allem die Grössenverhältnisse zu anderen entwickelteren Formen weisen. Unter den Hyphochytriaceen fände sie wohl zunächst am besten Platz, jener besonderen Gruppe der Chytridineen, die gerade wegen ihres entwickelteren Mycels ihren Namen erhalten haben. Hier läge in dem so oft in seiner Existenz bezweifelten *Tetrachytrium triceps* Sorokin eine Form vor, die freilich bei grossen Unterschieden, eine bemerkenswerte Analogie aufweist.

"Ob in gewissen kugeligen Gebilden, die ich einigemal unter den sporangientragenden Pflanzen fand, Dauerzustände, die hierher gehören, vorliegen, habe ich noch nicht sicher feststellen können."

(To be Continued.)

NOTES FROM MYCOLOGICAL LITERATURE. X.

W. A. KELLERMAN.

'PROFESSOR OUDEMANS' XIX CONTRIBUTION A LA FLORE MYCOLOGIQUE des Pays-Bas is a publication of unusual interest and importance. [Overdr. Ned. Kruidk. Archief. 3e Serie II, 4. pp. 851-928.] He enumerates 159 species nearly all being new to that region, and 74 of the species are new to science. In a series of 4 colored lithographic plates eleven of the new species are illustrated. Three of the described species are Pyrenomycetes, six Phycomycetes, and the remainder are Sphaeropsideae. We notice two new genera, one of Mucedineæ, namely, *Haplariopsis*, and the other of Dematieae, namely, *Torulopsis*, each with a single species.

P. H. ROLFS DISCLOSES THE RESULTS OF HIS STUDIES ON WITHERTIP and other Diseases of Citrous Trees and fruits in Bulletin No. 52, Bureau of Plant Industry, U. S. Department of Agriculture, illustrated by six full-page plates. He shows that Withertip, Anthracnose, Leaf-Spot, Lemon-Spot, and Canker are caused by *Colletotrichum gloeosporioides* Penzig. These destructive diseases were unknown in Florida until a comparatively recent time. A description of the fungus is given, also the synonymy, and preventive and remedial measures.

FRED MUTCHLER GIVES A LIST OF 86 SPECIES OF MYXOMYCETES of Lake Winona — a long list for one season's collecting in that vicinity, but the season was said to be very favorable for the study. It is published in the Proceedings of the Indiana Academy of Science 1902 (issued in 1903), and forms one of the sections of Contributions from the Zoological Laboratory of Indiana University under the direction of C. H. Eigenmann, No. 53.

LACK OF SPACE PRECLUDES A FULL ACCOUNT BY ERNEST S. SALMON of Cultural Experiments with Barley Mildew, *Erysiphe Graminis* DC., Ann. Mycolog. 2:70-99, Jan. 1904, but mention will be made of "sub-infection," *i. e.*, the fungus never produces powdery patches of *Oidium*, but only a few conidiophores which die away after a few days. . . "Further, in connection with the hypothesis which I have lately put forward that the leaf-cells of the host-plant of a 'biologic form' contain an enzyme which is destructive to the growth of the haustorium of any other 'biologic form,' it is conceivable that the amount of the enzyme contained in each epidermal cell may be sufficient to render it capable of destroying the first and perhaps even the second haustorium, but that successive haustoria invading the same cell may find the enzyme used up or insufficient to stop their growth. Under these circumstances a conidium here and there would be able to develop its first haustorium in a cell of the plant, and as this first haustorium soon grows enormously in size and branches out into

numerous lobed processes — playing in fact an all-important part in the life of the germinating conidium — the fungus might be able to produce a few mycelial hyphae and one or two conidiophores, as the result obtained by the first haustorium. . . . The evidence that is gradually accumulating on the subject of the relations between host-plants and parasitic fungi leads us to the conclusion that immunity and susceptibility are due to constitutional (physiological) peculiarities and not to any structural ones.”

F. S. EARLE PRESENTS IN TELLING LANGUAGE, IN SCIENCE FOR MARCH 25, 1904, the Necessity for Reform in the Nomenclature of Fungi. The scores of economic botanists in this country should be as much interested in this matter as the taxonomists themselves and lend their support toward stability in nomenclature. The skirmishing and preliminary, often futile attempts, duly visited by abundant derision, have cleared the sky and the path is now plainly marked. Professor Earle shows conclusively by abundant examples from Saccardo and from Engler and Prantl, that we have at present no widely “prevailing usage.” Speaking of the earlier writers, he says: “They had no idea of the type of a genus or a species in the sense in which we use the word to-day. Their ‘type,’ in so far as they had one, was a mental concept; and yet if we are to prevent this endless shifting of generic names from one group of plants to another, it becomes necessary to tie down these ancient concepts to the material basis of a single species. . . . Any attempt at reform based on a method devised for the purpose of ‘saving names’ can only end by adding to the existing confusion. Let us then nerve our minds to the point of seeing not only any, but, if necessary, all of our most favored names sacrificed to consistency, and unite in adopting the simplest and most direct code of rules that can be agreed upon. When this is once done and its provisions are carried out in good faith we shall by the one cataclysmic effort have placed the nomenclature of our science on so firm and stable a basis that we need no longer dread the appearance of each succeeding contribution to mycological knowledge on account of the changes in names that have been so constant and so annoying an accompaniment to each forward step in the past.”

PROFESSOR OUDEMANS AND MR. KONING REPORTED, in June 1903 (Koninklijke Akademie van Wetenschappen te Amsterdam), a *Sclerotinia* hitherto unknown and injurious to the cultivation of Tobacco, namely, *S. nicotianae* Oud. et Koning, of which also an account is given of the investigation and experiments, some biochemical work on the same, and a diagnosis latina. A colored lithographic plate illustrates the species. In a supplementary account (in August) larger cups are reported: -1.4-5 mill. wide and 0.2-0.3 deep, the stems 1.5-9 mill, in length.

THREE EDIBLE TOADSTOOLS, namely, *Coprinus micaceus*, *C. atramentarius*, and *C. comatus*, forms the subject of a popular and illustrated Bulletin (No. 98) issued by the Indiana Agricultural Experiment Station Feb. 1904, author J. C. Arthur.

THE OHIO MYCOLOGICAL BULLETIN, a 4-page Leaflet, illustrated, was issued by W. A. Kellerman during 1903, 12 Nos., being a part of the "University Bulletin" published by the Ohio State University, Columbus, Ohio. Price 10 cents a year — the remaining copies of the first volume, 1903, (Nos. 1-12) 50 cents. The Leaflet is to be continued under the name of Mycological Bulletin during 1904, devoted as heretofore to illustrations of the Mushrooms and Toadstools.

A LIST OF 103 SLIME MOULDS OF PENNSYLVANIA is given by D. R. Sumstine in *Torrey*, 4:36-8, Mar. 1904. Only about twice this number of species have been reported for the United States. Those reported in McBride's *North American Slime Moulds* and those noted in *Proc. Acad. Nat. Sci. Philadelphia* are included in this list in addition to the 34 of the author's herbarium.

Mycological articles in the *Comptes Rendus des Séances de l'Académie des Sciences*, Vol. 137 (last half of 1903) are: Magnin et Viala, *Sur la Variation du Bornetina corium suivant la nature des milieux*; Vuillemin, *Une Acrasiée bacteriophage, Sur une double fusion des membranes dans la zygaspoire des Mucorinées*; Delacroix, *Sur une Maladie bactérienne du tabac, le chancre ou anthracnose (Bacillus aeruginosus n. sp.)*, *Sur la jaunisse de la betterave; maladie bactérienne*; Dangeard, *Sur le genre Ascodesmis*; Eriksson, *Sur l'appareil végétatif de la rouille jaune des Céréales*; Pinoy, *Nécessité d'une symbiose microbienne pour obtenir la culture Myxomcetes*; Guillermond, *Contribution à l'étude cytologique des Ascomycètes*.

PERSONAL NOTES AND NEWS.

PROFESSOR CLEMENTS of the University of Nebraska has begun work on the systematic botany of the Lichens of North America. He is examining material and collecting data, and does not intend to begin publication for some years. Collectors of lichens may help in this work by sending new material to him.

PROFESSOR HEALD of the University of Nebraska has taken up the critical study of the so-called "crown gall" of the raspberry.

A CORRESPONDENT offers JOURNAL OF MYCOLOGY Vols. 2-7 inclusive for sale, at \$10.00; Vol. 2 lacks Nos. 8-12; *two* sets of Vols. 5 and 6 are included in the offer — one volume being bound. Address editor of this Journal.

MR. E. W. D. HOLWAY has removed from Decorah, Iowa; his address is STATE UNIVERSITY, MINNEAPOLIS, MINN. Here he will devote himself exclusively to Mycological studies.

MR. C. G. LLOYD of Cincinnati who has for a year been travelling, visiting and studying in Europe, returned to his home a few days ago. While abroad he inspected all the important mycological collections — giving attention to the higher fungi, Puff-balls and related groups — on which he is a recognized authority.

MR. J. M. VAN HOOK, one of Professor Atkinson's assistants, has been made Plant Pathologist to the Ohio Experiment Station, assisting Professor Selby. His new address is Wooster, Ohio.

MR. A. B. SEYMOUR, Cambridge, Mass., offers to exchange early numbers of the JOURNAL OF MYCOLOGY for those lacking in his set.

PROFESSOR MEL T. COOK, who hitherto has had charge of the Department of Biology, De Pauw University, Greencastle, Indiana, has accepted the position of Plant Pathologist at the newly established Experiment Station of Cuba.

PROFESSOR BESSEY has recently contributed an article on "The Fungi" to one of the cyclopedias now in course of publication. In it he has given at length his views as to the relationship of the various groups of the fungi.

PROFESSOR F. S. EARLE has resigned his position as assistant curator of the New York Botanical Garden, says Torreya, to accept the directorship of the ESTACION AGRONOMICA CENTRAL DE CUBA, just established at Santiago de las Vegas, 12 miles from Havana. Professor C. F. Baker is appointed as botanist; Mr. Percy Wilson, assistant botanist; and Mr. Wm. T. Horne, assistant pathologist.

Amateurs and beginners in mycology will be assisted in naming parasitic fungi, as far as possible. To this end correspondents are asked to send us an ample quantity each species accompanied by a slip giving a *No.*, *Host-plant*, *Locality*, *Date*, *Collector's Name*, [which does *not* subject matter to letter rate postage]: The sender's *name and address should be on the outside of the package*. Postal regulations make it necessary that the postage [1 ct. per oz.] be fully prepaid.

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NOTES.

We have to thank Dr. F. E. Clements, of Nebraska, for the literal translation made at our request of Saccardo's suggestions (*rules* we will call them) for Description and Nomenclature of Fungi.

Some of Saccardo's Rules relative to Mycological terminology should be especially commended. Among these should be mentioned the advantage — the necessity rather — of a concise and precise diagnosis of new species, new genera, etc. He rightly condemns the practice of roving descriptions — desirable for the general and readable account of course, but not to take the place of the terse description. We would also commend his terminology for use in connection with the several large groups, the attention to double citation of authors, the additional listing of Aecidial forms, etc.

But with equal emphasis we protest against any *exceptions* to the rule of priority which is now universally admitted to be a fundamental principal in biological nomenclature. We dissent when he says that *Puccinia sambuci* (Schw.) Arthur and *Puccinia hibisciata* (Schw.) Kellerm. are "*mis-statements*." These forms of expression do not men — and never have been mistaken for Saccardo's assertion — that Schweinitz knew the "*perfect*" (or teleutosporic) form of the species in question. The first name applied to the species *must stand*, and that too in spite of the fact that the namer knew it very imperfectly — or even wholly misunderstood it — *else* no stability in nomenclature is guaranteed.

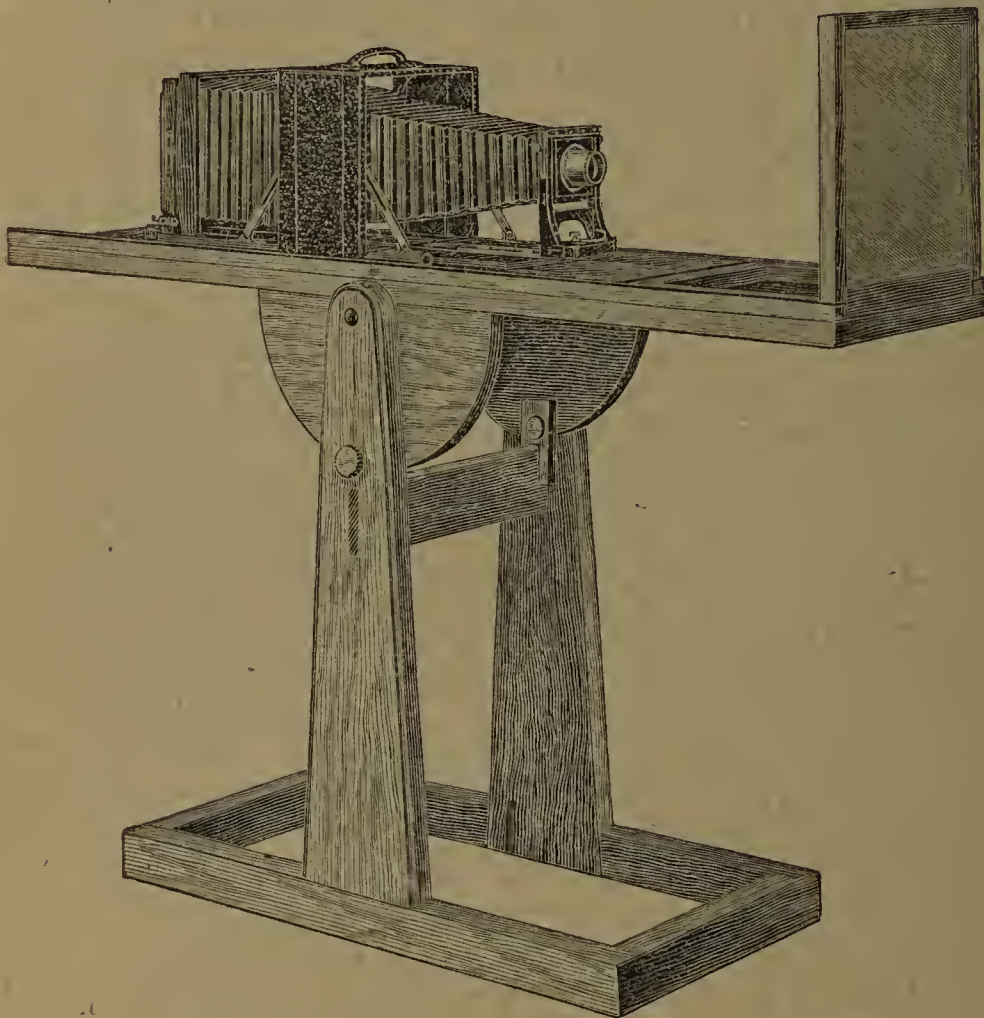
This NUMBER of the JOURNAL is largely occupied by the republication of original descriptions of New Genera of Fungi published since 1900. The remainder of this installment (for the July No.) will include all the genera to the beginning of the present year and therefore but little space will be needed later for the new genera as they appear from time to time. Their publication (or *verbatim* republication) in *one* periodical will be presumably of great advantage to students and workers, and it is intended to carry out this plan in the future with the kind and prompt co-operation of the authors.

The July Number of the JOURNAL will be issued about the middle of June so as to reach subscribers before the summer vacation begins.

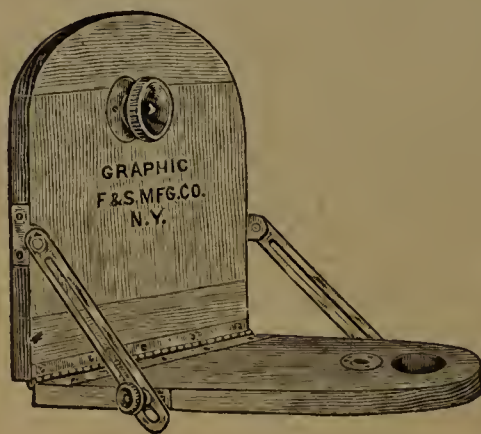
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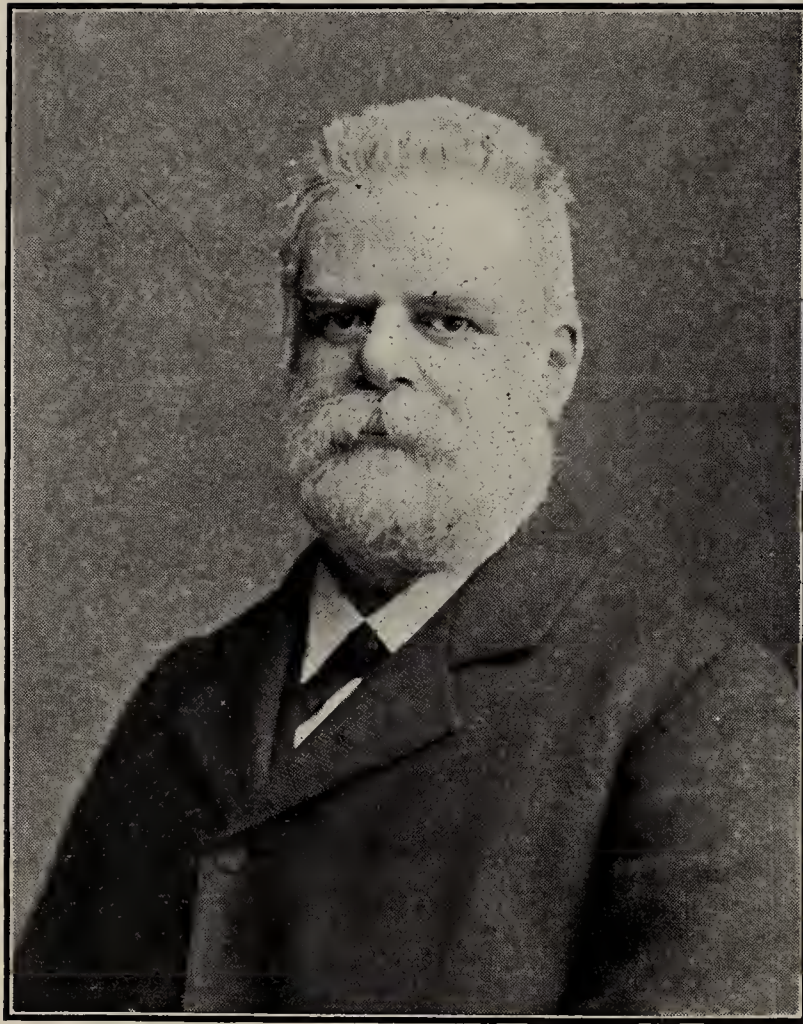
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NEW SPECIES OF PYRENOMYCETES.

A. P. MORGAN.

TRICHOSPHERA INVISA Morgan n. sp.—Perithecia superficial, gregarious, ovoid, clothed with long straight pale brown bristles. Asci 8-sporous, paraphysate, with a short stalk, 55-65 x 8-9 mic.; spores globose or oval, hyaline, smooth, 8-9 x 7-8 mic.

Growing on old wood of Platanus. Preston, O., 1897. Perithecia 0.3-0.4 mm. in diameter, the smoky-pellucid hairs 0.10-0.15 mm. in length, scarcely septate. An elegant species, but so like the substratum in color as to be overlooked.

TREMATOSPHERA FAGINEA Morgan n. sp.—Perithecia gregarious, semi-immersed, ovoid, smooth, black; the ostiola simple, pertuse by a small pore. Asci cylindric, 8-sporous, the spores obliquely uniseriate, with a short stalk and long filiform paraphyses, 110-128 x 11-13 mic.; spores elliptic-oblong, at first hyaline, becoming smoky-pellucid, 3-septate, 14-17 x 8-10 mic.

Growing on a prostrate trunk of Fagus; Preston, O., March, 1904. The perithecia 0.4-0.5 mm. in diameter, emerging about half way out of the bark.

BERTIELLA BOTRYOSA Morgan n. sp.—Perithecia caespitoseconnate into small depressed tubercles, circular or irregular in shape; the individual perithecia minute, subglobose, regulose, black, with simple ostiola. Asci cylindric-clavate, with a short stalk, paraphysate, 8-sporous, the spores biseriate, 100-110 x 11-14 mic.; spores fusiform, hyaline, 1-3-septate, 20-30 x 5-6 mic.

Growing on hard wood of *Ulmus*; Preston, O. The perithecia about 0.2 mm. in diameter, nearly always connate, 5-10 together into a small tubercle and the wood often blackened beneath them. The specific name is given because the plant answers remarkably well to the *Sphaeria botryosa* described by Fries, S. M. III, 342. The genus *Bertiella* should stand next to *Ziznoella* or else be incorporated with it.

ENCHNOSPHERA HISPIDA Morgan n. sp.—Perithecia superficial, gregarious, ovoid, the wall thick and carbonaceous, clothed with long, black, straight bristles. Asci clavate-cylindric, 8-sporous, paraphysate, 110-120 x 10-12 mic.; spores clavate-oblong, obtuse at both ends, hyaline, 0-3-septate, 15-20 x 5-8 mic.

Growing inside the bark of *Acer*; Preston, O., 1897. Perithecia 0.3-0.4 mm. in diameter, the thick straight bristles 0.1-0.2 mm. in length.

ACANTHOSTIGMA DISPAR Morgan n. sp.—Perithecia superficial, ovoid, black, papillate, the surface with minute scattered bristles or nearly glabrous, the wall composed mostly of large globose membranaceous cells. Asci lanceolate, curved, 8-sporous, the spores overlapping 2-3-seriate, the paraphyses scanty, the stalk very short, 160-180 x 9-12 mic.; spores linear-fusiform, curved, hyaline, 7-11-septate, 45-60 x 4 mic.

Growing on rotten wood; Preston, O., 1900. Perithecia gregarious, closely crowded or scattered 0.3-0.4 mm. in diameter. The young perithecia are distinctly bristly but the short bristles nearly disappear at maturity. The globular cells of the wall expand when moistened and are 20-25 mic. in diameter; this feature suggests the genus *Winterina* and indeed if Berlese's definition of the genus *Winterella* is to be accepted the species is so referable; the wall of the perithecium is tuberculigerous at least when moist. The species is closely related to *Acanthostigma scopula* and *A. minutum*; this is plainly shown by Berlese's "Clavis analytica", division D. To these must be added *A. scleranthoides* and *A. chusqueae* in the Sylloge XIV.

HYPOXYLON REGALE Morgan n. sp.—Stroma superficial, effused in small irregular spots or patches, composed entirely of confluent perithecia. Perithecia large, globose, black, the ostiolar minutely papillate. Asci cylindric, short-stalked, 150-170 x 10-12 mic., 8-sporous, the spores obliquely uniseriate, with slender delicate paraphyses; spores elliptic-fusoid, inaequilateral, brown, 20-27 x 9-11 mic.

Growing on the surface of old soft wood of *Acer*, *Liriodendron*, etc. The stromata irregular in outline, composed of two or three to many perithecia; the perithecia 0.7-1.0 mm. in diameter.

NOTES ON UREDINEAE. II.

E. W. D. HOLWAY.

PUCCINIA CARICIS-ASTERIS Arthur.

An abundance of this Puccinia was found in 1902 on *Carex sparganioides* Muhl., following an aecidium on *Aster sagittifolius* Willd. growing with it. No other Aecidium or Puccinia was to be found in the vicinity. Plants of the Aster from another locality were placed in the greenhouse in 1903; teleutospores from the *Carex* were sown on them April 26; spermogonia appeared May 4 and aecidia May 13; a second sowing was made May 6; spermogonia appeared May 12 and aecidia were collected May 17 and May 20. The last infection was very strong, the plant being covered with aecidia, as the germinating teleutospores were scraped off into water and placed over the entire plant.

PUCCINIA ALBIPERIDIA Arthur.

Teleutospores from *Carex pubescens* Muhl. were sown on *Ribes gracile* Mx., April 26, 1903; aecidia were collected on May 16; spermogonia appeared in great abundance. This species is I think one of the common *Ribes* aecidia, but field observations indicate that we have others and that the more common one with large cups on much thickened spots has teleutospores on another *Carex*.

PUCCINIA RIPARIA Holway n. sp.

o. Spermogonia epiphyllous, very few, at first yellow, becoming darker.

I. Spots yellow, not thickened; aecidia hypophyllous, scattered, 1-6 in a cluster, or in greenhouse cultures covering a considerable portion of the leaf, margin recurved and split into 2-8 sections; aecidiospores hyaline, globose, minutely roughened, 22-26 μ , mostly 22 μ in diameter, walls thin.

II. Uredosori hypophyllous, oblong, brown; uredospores borne on hyaline pedicels 35-40 μ long, from which they easily fall when mature, brown, echinulate spines about 3 μ apart, wall about 2 μ thick, germ-pores 3, 26-33 x 22-26 μ .

III. Teleutosori hypophyllous, oblong, soon breaking through the epidermis which is persistent around them; teleutospores oblong to oblong-clavate, constricted at the septum, 30-40 x 13-15 μ ; apex strongly thickened, 7-11 μ , mostly 7-8 μ ; pedicel tinted, up to the length of the spore; upper cell mostly rounded, rarely pointed or truncate in the mature spore, 16-19 x 11-15 μ ; lower cell narrower, 13-19 x 10-12 μ ; wall thin.

o. I. On *Ribes floridum* L.Her., II. III. on *Carex riparia* Curt. The species described above were collected at Decorah, Ia., by the writer. The aecidium on *Ribes floridum* was first observed in 1901. In 1902 a tuft of the *Carex* covered with the *Puccinia* was tied onto a clump of the *Ribes* which had never been attacked by any aecidium, and on June 16 many specimens of the aecidium were collected. On May 6, 1903, teleutospores were sown in the greenhouse on *Ribes floridum* and aecidia were mature May 22; a second sowing was made May 15; spermogonia appeared May 23 and aecidia May 30. Sowings made the same days on *Urtica* and *Ribes gracile* were without result.

This aecidium is very distinct from any other *Ribes* aecidium, having white spores as well as white peridia; the spermogonia are very few. *Puccinia albiperidia* has small, round, brown teleutospores, not surrounded by the epidermis, while those of *P. riparia* are oblong, black, and with the ruptured epidermis very noticable. Good uredospores of the former have not been collected; Dr. Aruthur describes them as small. These two species appear to be quite distinct from European species, which all have teleutospores of the *Puccinia Urticae-Caricis* type, with much larger and darker teleutospores, the smallest measurements given by Klebahn being $37-56 \times 15-21\mu$.

PUCCINIA MODICA Holway n. sp.

Sori amphigenous, round or elongated, $\frac{1}{2}$ -1 mm.; uredosori brown; uredospores globose, closely and evenly tuberculate, yellowish-brown, $20-24\mu$, germ-pores 4-5, scattered; teleutospores black, pulverulent; teleutospores broadly elliptical, brown, smooth, $36-40 \times 24-32\mu$, wall thick, up to 4μ , apex rounded, $4-8\mu$ thick, pedicel persistent, hyaline, up to 120μ long; one-celled teleutospores occur.

Mexico; on *Arenaria* sp.; Etna, Oaxaca, No. 5401 (type); Oaxaca, No. 5415; on *Arenaria peyritshii*; Cuernavaca No. 5271; all collected by the writer in 1903; on *Arenaria* sp., Tumbala, Chiapas, No. 3343, E. W. Nelson, 1895; near Salazar, No. 7039 and on *Arenaria reptans*, No. 7038, both by Rose and Painter in 1903.

PUCCINIA ECHINOPTERIDIS Holway n. sp.

II. Uredosori brown, amphigenous, mostly on the under side of the leaves and on the stems, circinate in small groups, globose to oblong, or irregular and confluent; spots pale yellow; uredospores light brown, globose to ovate, $26-33 \times 22-26\mu$ coarsely echinulate.

III. Teleutospores amphigenous, black, pulverulent, small, becoming confluent; teleutospores globose to broadly elliptical, not constricted, wall nearly uniform in thickness, sometimes slightly

thickened opposite the pedicel, which is variously inserted, mostly laterally, often in line with the septum, and globosely inflated next the spores and about the same length, strongly verrucose-reticulate, $30-44 \times 22-37\mu$; dark reddish brown. On *Echinopteris Lappula* Juss., Guadalajara, Mexico, No. 5036 Sept. 25, 1903. Tehuacan, Puebla, Mexico, No. 5338, Nov. 7, 1903. Collected by the writer.

Closely allied to *Puccinia insueta* Wint., from which it varies in its entirely different uredospores and the much stronger reticulations of the teleutospores.

PUCCINIA RUBRICANS Holway n. sp.

Spots crimson, mostly circular, from 1-6 mm. in diameter, most leaves having a few large spots and numerous scattered small ones. Sori amphigenous, mostly hypophyllous, solitary, scattered, or circinate on the larger spots.

II. Uredosori light brown; uredospores pale brown, globose, rarely ovate, strongly echinulate, spines $3-4\mu$ apart, wall thick, $4-6\mu$, $36-44 \times 32-36\mu$.

III. Teleutosori following in the uredosori, black, teleutospores elliptical, ferruginous, strongly verrucose, $60-68 \times 40-44\mu$, apex shortly acute, or rounded, slightly thickened, pedicel hyaline, up to 80μ long.

Collected by the writer on *Heteropteris Portillana* Wats., Guadalajara, Mex., Sept. 28, 1903, No. 5063.

Heliotype plates, from photomicrographs, will be distributed with the separates.

Minneapolis, Minn., May 20, 1903.

NOTES ON FUNGI. I. NEW OR INTERESTING AMERICAN UREDINEÆ.

BY P. L. RICKER.

AECIDIUM WILLIAMSI Ricker sp. nov.—Spots yellowish, somewhat thickened; peridia densely clustered, mostly hypophyllous, cylindrical or elliptical; spores pale yellow, subglobose, $19-26\mu$, minutely verrucose; wall medium, 2μ .

On leaves and stems of *Lithospermum angustifolium* Mx., Brookings, S. D., T. A. Williams, June 22, 1893. Specimens are also in the herbaria of the U. S. National Museum and Dr. J. C. Arthur.

This species is not related to *Puccinia lithospermi* E. & K., originally described on *Lithospermum canescens*; but which proves to be *Evolvulus pilosus* Nutt., the *Aecidium* of which is as yet undescribed, but which the author has recently had the opportunity of examining in the herbarium of Mr. M. A. Carleton of this Department.

PUCCINIA ARUNDINARIAE Schw.—This rare species which was reported by Dr. J. C. Arthur in a recent paper¹ as ranging from North Carolina to Alabama, was recently collected at Votaw, Hardin Co., Tex., March 8, 1904, on leaves of *Arundinaria* (probably *A. macrosperma*) by Mr. E. R. Hodson of the Bureau of Forestry.

PUCCINIA BURNETTI Griff.—This species was recently discovered in the U. S. National Herbarium on leaves of *Eriocoma cuspidata* Nutt., collected by Sereno Watson (No. 1292) Monitor Valley, Nevada, July 1868.

PUCCINIA CRANDALLII Pamm. & Hume.—Specimens of this species have recently been examined on *Festuca kingii* in the U. S. National Herbarium from Lima, Mont., on No. 313 C. L. Shear, June 30, 1895; Stein Mts., Oreg., on No. 2445 J. B. Leiberger, July 2, 1896; Sunset, Col., G. W. Letterman, July 1886; Sweetwater Co., Wyo., on No. 3300 Aven Nelson, July, 1897.

PUCCINIA CYNODONTIS Desm.—On leaves of *Cynodon dactylon*, Lake City, Fla., Ricker and Hume, July 29, 1902. A small amount of uredosporic material was collected near Mr. Hume's house, it being the first time that a Rust has been reported from this country on this host. The early descriptions and that in Saccardo's *Sylloge Fungorum* are rather incomplete but agree with the specimen as far as they go. The characters drawn from this collection are as follows:

Uredosori hypophyllous, prominent, rupturing the epidermis in linear rows, the epidermis remaining, early naked, pale; uredospores ovoid or globose, 19-26 μ in diameter, minutely verrucose, pores several, scattered, wall medium thick.

PUCCINIA DEFORMATA B. & C.—On glumes and pedicels of *Olyra latifolia* L., near Mayaguez, Porto Rico, A. A. Heller, Jan. 30, 1890. This seems to be a very rare species. It was originally collected by Wright in Cuba, and the description was rather brief. Our specimen shows the following characters:

Teleutosori forming conspicuous often irregular ferruginous bunches which are often confluent; teleutospores elliptical oblong, only very slightly constricted, 19-26 x 28-40 μ , obtuse at the ends, apex slightly or not at all thickened, wall thick, golden brown; pedicel hyaline, slender, flexuous, often attached somewhat laterally, up to twice the length of the spore.

I am indebted to Dr. W. G. Farlow for comparing the specimen with the duplicate type in the Cryptogamic Herbarium of Harvard University.

PUCCINIA HALENIAE Arth. & Holway.—On *Gentiana calycosa* Griseb., Teton Mts., above Leighs Lake, Wyo., No. 1109 Merrill & Wilcox, July 26, 1901. The material agrees in every re-

¹Bot. Gaz. 34:19, 1902.

spect with the description and this is the first collection known on this host.

PUCCINIA OBSCURA Schrœt.—A species not before observed by the author was collected on *Juncoides comosum* (E. Mey.) Sheld., at Ukiah, Oreg., by Mr. M. A. Crosby, Aug. 21, 1903.

U. S. Bureau of Plant Industry,
Department of Agriculture.

NEW SPECIES OF FUNGI FROM VARIOUS LOCALITIES.

BY J. B. ELLIS AND B. M. EVERHART.

DENDRODOCHIUM SEPULTUM E. & E.—On dead limbs of *Ulmus pubescens*. Natoma, Kansas, Jan. 8. 1904. (E. Bartholomew, 3139).

Sporodochia densely gregarious, orange-red, single or several smaller ones subconfluent, at first entirely covered by the epidermis which is raised into flattish pustules 1-2 mm. diam., soon ruptured, but still closely adherent, until the upper part entirely disappears, exposing the concave, pezizoid sporodochium. Sporules oblong, continuous, rounded at the ends, 10-15 x 5-6 μ , hyaline or with a slightly yellowish tinge, terminal on fasciculate, thread-like basidia, 30-70 μ long, simple or furcately branched.

Nos. 2831 and 2899 (Bartholomew) on *Morus alba* are the same as this.

This may be the conidial stage of *Peziza cruenta* Schw.

SPHÆROPSIS GRANDINEA E. & E.—On twigs of Maple. Riverside, Ill. March 1903. (E. T. & S. A. Harper, 796).

Perithecia minute, ($\frac{1}{4}$ - $\frac{1}{3}$ mm.) thickly scattered, raising the bark into minute pustules but hardly rupturing it. Sporules elliptical or subovate, 15-20 x 8-10 μ , on stout basidia as long as the sporules or a little longer.

Sphæropsis clintonii Pk. is on decorticated wood and has sporules oblong-elliptical and a little shorter. *S. acerina* E. & B. (according to our specm.) is a *Haplosporella*,—perithecia in a cortical stroma, 2-6 in a stroma, sporules oblong.

HARKNESSIA (?) TETRACERAE E. & E.—On leaves of *Tetracera volubilis*. Nicaragua, 1903. (C. F. Baker, 3992.)

Amphigenous, apparently superficial, consisting of scattered, subhemispherical heaps of conidia which are ovate or elliptical, 12-15 x 6-7 μ , hyaline at first, then brown with a light colored streak across the middle. The heaps of conidia are black and 1-1 $\frac{1}{2}$ mm. in diameter.

No perithecium was seen nor any cavity in the substance of the leaf from which the conidia were discharged, and in this respect the fungus does not agree with the generic character of either *Harknessia* or *Melanconium*.

HARKNESSIA RHOINA E. & E.—On dead leaves of *Rhus integrifolia*, still hanging on the tree. Claremont, Calif. Nov. 1903. (C. F. Baker, 3948).

Perithecia epiphyllous, scattered, medium size, ovate, base sunk in the substance of the leaf, upper half projecting with a round formation at the apex. Sporules elliptical, brown, subinequilateral, about $20 \times 10 \mu$, on filiform hyaline basidia, about 25μ long.

DIPLODIA FAIRMANI E. & E.—On dead limbs of *Menispermum canadense*. Lyndonville, N. Y. Oct. 1900.

Perithecia scattered, small ($\frac{1}{2}$ mm.), covered by the epidermis which is raised into little pustules and tardily ruptured. Sporules elliptical, uniseptate, constricted, brown, $20 \times 10 \mu$.

D. hypoxyloides E. & E. on the same host, has perithecia twice as large and sporules $12-16 \times 4-5\frac{1}{2} \mu$ and differs otherwise.

DOTHIORELLA TOXICA E. & E.—On dead limbs of *Rhus toxicodendron*, Riverside, Ill. March 1903. (E. T. & S. A. Harper 795).

Stroma acutely elliptical, 1 mm.- $\frac{1}{2}$ cm. long, bursting out through longitudinal fissures in the bark. Perithecia 2-6 in a stroma, $\frac{1}{3}-\frac{1}{2}$ mm. diam., white inside, with a papilliform ostiolum, basidia as long or longer than the sporules, which are broadly elliptical, 1-3 guttulate, hyaline, $12-20 \times 10-12 \mu$, or subglobose, $10-12 \mu$.

This differs from *D. rhoina* E. & E. in its much larger sporules and acutely elliptical stroma.

CEUTHOSPORA ABIETINA E. & E.—On dead limbs of *Abies balsamea*. Harraby, Lake Rousseau, Ontario, Canada, Sept. 1902. (E. T. & S. A. Harper, 792).

Stroma cortical, valsiform, circular, about 1 mm. diam., raising the bark into flattish pustules crowned with the small, black, papilliform ostiolum. Perithecia ovate, 2-6 in a stroma, membranaceous. Sporules cylindrical, straight, or nearly so, $6-7 \times 1\frac{1}{2} \mu$, on filiform basidia longer than the spores. The perithecia have their ostiola all united into a central one.

ASCOCHYTA CONFUSA E. & E.—On leaves of *Smilax hispida*. Yates, New York. Oct. 1900. (Dr. C. E. Fairman, 1512); and on leaves of *Smilax*, Harpers Ferry, W. Va. (E. T. & S. A. Harper, 926).

Spots amphigenous, round or irregular, 2-5 mm. diam., white, thin, almost transparent, with a narrow, dark-brown, raised border. Sporules ovate or elliptical, smoky-hyaline, $7-12 \times 3\frac{1}{2}-4\frac{1}{2} \mu$.

Ascochyta smilacis E. & M. Am. Nat. Dec. 1882, p. 1002, has sporules $11-22 \times 6-7 \mu$.

SEPTORIA SMILACIS E. & E.—On living leaves of *Smilax*, Harpers Ferry, W. Va. Aug. 1894. (E. T. & S. A. Harper, 924).

Spots amphigenous, round or subangular, ferruginous, lighter

in the center, with a narrow, slightly raised, darker border, 2-5 mm. diam., subconfluent, scattered over the green parts and also over brown, dead areas of the leaf. Perithecia amphigenous, innate in the substance of the leaf, 100-110 μ diam., the apex erumpent, broadly perforated and finally collapsing, cirrhi light horn-color. Sporules filiform, curved, faintly guttulate hyaline, 35-40 x 1½-2 μ .

S. similacina Dur. & Mont. has no spots and differs otherwise.

MICROPERA VACCINII E. & E.—On old stems of *Vaccinium corymbosum*, Millers, Ind. Oct. 1903. (E. T. & S. A. Harper, 890).

Perithecia ovate-conic, flesh-color, subcuticular, erumpent in a small (1 mm.) black tubercle. Sporules arcuate, ends acute and hyaline, 40-50 x 3 μ .

MYXOSPORIUM FUMOSUM E. & E.—On dead limbs of *Tilia americana*. River Forest, Ill. May 1903. (E. T. & S. A. Harper, 799).

Acervuli sunk in the surface of the inner bark, pale at first, becoming black, subcircinately arranged or scattered, discharging the conidia through a common opening and forming a depressed-conical mass of a sooty-black color on the surface of the bark. Conidia lunate, continuous, hyaline, abruptly contracted and subacute at the ends, 12-15 x 4-6 μ ; much resembling those of *Marsonia populi* (Lib.).

GLOEOSPORIUM HETEROPHYLLUM E. & E.—On leaves of *Artemisia heterophylla*, near Claremont, Calif. Jan. 1. 1904. (C. F. Baker, 3982).

Acervuli sunk in the substance of the leaf on black spots 2-3 mm. diam. soon erumpent, subconical, black. Conidia oblong or clavate-oblong, guttulate, curved, hyaline, 14-18 x 3-5 μ , ends obtuse.

Gloeosporium maculosum Sacc. on *Artemisia vulgaris* s on the stems, has smaller acicular conidia (18-10 x 2 μ) and the acervuli are scarcely erumpent.

AMPHISPHERA GRANULOSA E. & E.—On old oak barrel staves lying on the ground. Lyndonville, N. Y. Sept. 1900. (Dr. C. E. Fairman).

Perithecia erumpent-superficial, globose or depressed-globose, granular-roughened, about ½ mm. diam., quite evenly and thickly scattered; ostiolum minute, papilliform. Asci cylindrical, short-stipitate, 65-70 x 4 μ , obscurely paraphysate. Sporidia uniseriate, oblong, uniseptate, scarcely constricted, pale-brown, slightly narrowed at each end, 10-12 x 3-3½ μ .

A. confertissima E. & E. has rather smaller perithecia and broader sporules. *A. conferta* Sz. has the perithecia seated on a radiate-fibrose mycelium but is otherwise much like this.

DIATRYPE NIGERRIMA E. & E.— On bark of Vitis, Glencoe, Ill. June 1903. (E. T. & S. A. Harper, 904).

Stroma superficial, effused, tubercular-roughened, black outside, white within, tubercles 1-1½ mm. diam. or by confluence ½-1 cm. Perithecia monostichous, globose or ovoid, crowded, small, ¼-⅓ mm. narrowed above into short neck terminated by the minute, subglobose ostiola which (8-10 together) rise through the surface of the stroma in little conical projections scattered indiscriminately over the stroma, both on and between the tubercles and much resembling small, black perithecia cleft across the top by a narrow slit through which the erumpent tuft of ostiola arise. Asci lanceolate, finally rounded at the top, p. sp. 25 x 3-4μ. Sporidia 8 in an ascus, allantoid, smoky-hyaline, slightly curved, 8-10 x 1-2μ.

VALSARIA MAGNOLIAE E. & E.— On dead limbs of Magnolia (cult.), London, Canada, Dec. 1903. (J. Dearness, 2082).

Stroma cortical, effused, blackening the inner bark. Perithecia sunk in the inner bark, then semi-erumpent, white inside, about ¼ mm. diam. scattered irregularly, or valsiformly aggregated, or seriate, soon deciduous. Asci cylindrical, subsessile, paraphysate, 80-100 x 10-12 μ with the sporidia obliquely uniseriate or 100-150 μ with sporidia lying end to end. Sporidia uniseriate, oblong-elliptical, 18-23 x 8-10 μ, more or less constricted in the middle, brown.

This was accompanied by *Sphaeropsis magnoliae* E. & D.

PHYLLACHORA CINEREA E. & E.— On dead branches of Catalpa, London, Canada, Nov. 1903. (Dearness, 2087).

Stromata scattered, seated on the inner bark which is uniformly blackened, orbicular, ½ mm. diam. or oblong ¾ x 1½ mm., cinereous within, disk fusco-cinereous, erumpent, flat, surrounded by the ruptured margin of the epidermis. Asci clavate-cylindrical, 80-100 x 12-15 μ, paraphysate. Sporidia biseriate, ovate-elliptical, hyaline 12-15 x 5-7μ, continuous.

Most of the stromata contain only stylospores 8-10 x 4-5μ, hyaline, continuous, oblong-elliptical or ovate-elliptical and then the fungus does not differ appreciably from *Phoma diatrypea* (C. & E.) Sacc. which is found on *Chiononthus*.

There are no true perithecia, the stroma containing merely ascigerous or sporuliferous cavities.

PEZIZA HAINESII Ell., Bull. Torr. Bot. Club, is hardly distinct from *P. semitosta* B. & C., the only difference being the color of the hymenium.

A NEW SPECIES OF PERONOSPORA.

W. A. KELLERMAN.

In the Spring of 1902 a Powdery Mildew was found, near Columbus, Ohio, on the False Mermaidweed, *Floerkea proserpinacoides* Willd. A quantity of the host plant remained in the collecting box over night, and when inspected the following day every specimen was found to be covered by the conidiophores uniformly distributed over the entire host. A few days later the same locality was visited but the unfavorable weather in the meantime proved disastrous to the fungus and unfortunately no additional material was obtained for thorough study of the parasite. A search the following Spring was likewise unsuccessful, but ample material was obtained in May of the present year and the investigation so far as carried on to date is here reported.

The host plants are dwarfed by the parasite though not distorted, and usually the entire plant harbors the fungus—all parts of the stem and leaves being evenly, though in the main rather sparsely covered by the conspicuous conidiophores. The shrivelled leaves and stems later however present a rather compact dull white layer of the richly branched and now collapsed conidiophores. Later infection is seen often restricted to the lower leaves of vigorous hosts but such cases are the exception rather than the rule.

The conidiophores in their mode of branching, size, etc., as well as the conidia and zygospores, are almost the exact counterpart of the well known and widely distributed *Peronospora parasitica* (Pers.) Tul., occurring on the various genera of the family *Cruciferae*. There is the very large and long main stem with the abundant and irregular branching near the apex. In the fungus on *Floerkea* however the main axis is relatively a little larger and the ultimate branchlets are also a trifle more elongated. The graceful curves of the latter are more pronounced in case of the *Floerkean* parasite and no small spurs or short tips leaving the branches at right angles, or presenting a runcinate appearance, were observed,—whereas in the *Peronospora parasitica* these are very often noticed.

It should be stated that *Peronospora parasitica* causes, in some cases at least, slight distortion of the host. Sometimes there is evident hypertrophy in local areas, and there is often an unusual mode of branching and anomalous aspect of the plant which is attacked—all of which suggests that there is some radical difference between this fungus and the one occurring on *Floerkea*. Moreover, the Mildew on the *Cruciferae* is often restricted to portions of the stem or limited areas of the leaves—never the case, so far as observed, relative to the *Peronospora* now under consideration.

A point to be emphasized is the distant location in systematic classification of the hosts of *Peronospora parasitica* and that of the parasite of *Floerkea*. Were there a close affinity between the plants attacked by these Mildews, the marked morphological similarity of the latter could well be interpreted as indicating a close genetic relationship. They might in such a case be, with some degree of propriety, recorded as biological species with as yet slightly perceptible morphological differentiation. But the facts noted seem to warrant the conclusion that we have to do with an unnamed but valid species, and consequently the name *Peronospora floerkeae* is proposed.

Unfortunately the germination of the conidia was not witnessed. Repeated efforts to determine whether a germ tube proceeded from the conidium, or whether this formed zoospores, were unsuccessful. In one or two cases a structure was seen on the slide that was with some hesitation taken to be the germ tube and in multitudes of conidia observed no indication of zoospore formation was detected. Consequently the fungus is referred to the genus *Peronospora* rather than *Plasmopara*. If however an error has been made here the plant would bear the name of *Plasmopara floerkeae*. The following diagnosis is offered.

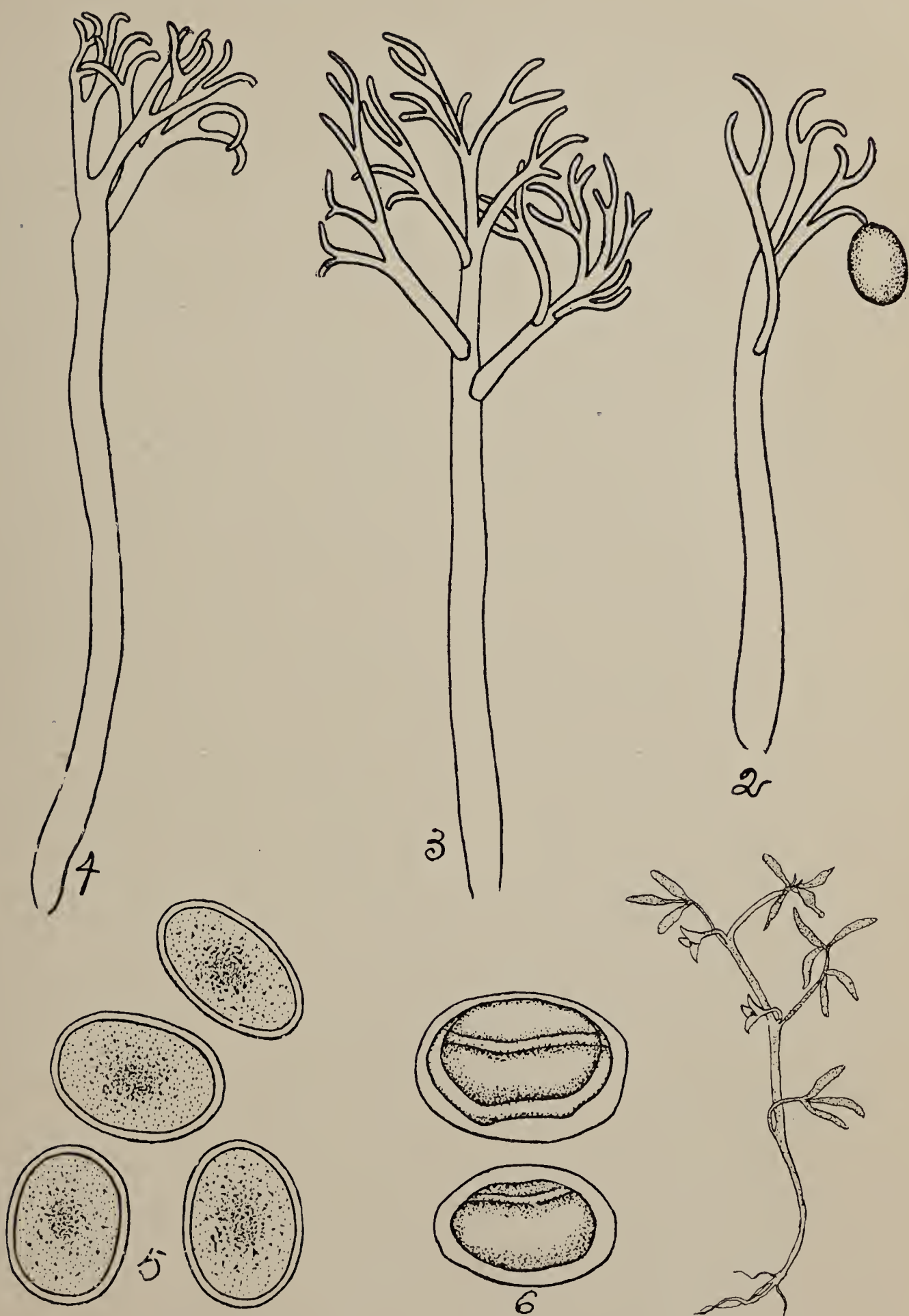
PERONOSPORA FLOERKEAE Kellerm. n. sp.—Conidiophores stout (16-18 μ wide) simple below and elongated, irregularly and profusely branching above, the branches again subdividing sometimes dichotomously but oftener irregularly, the ultimate branchlets more or less plainly dichotomous also much elongated and strongly curved; the branches are very much narrower than the main axis of the conidiophore, the ultimate branches being very narrow and bearing large hyaline oval or sub-globose conidia 24-32 x 18-25 μ ; germination unknown. Oospores numerous, sub-globular, 24-36 μ , the wall light brown and smooth or slightly rugose.

On *Floerkea proserpinacoides* Willd.; Columbus, Ohio. May 1902 and 1904.

Strongly resembles *Peronospora parasitica* (Pers.) Tul. but more irregularly branching, the ultimate branchlets longer, usually dwarfing but not otherwise deforming the host which does not belong to *Cruciferae* (as do all the hosts of *Peronospora parasitica*) nor to a closely related family.

EXPLANATION OF PLATE 74.

Fig. 1. *Floerkea proserpinacoides* dwarfed by *Peronospora floerkeae* which infests it throughout. Figs. 2, 3, 4. Conidiophores of *Peronospora floerkeae*. Fig. 5. Four conidia. Fig. 6. Two oöspores.



PERONOSPORA FLOERKEAE KELLERMAN NOV. SP.

CULTURES OF PUCCINIA THOMPSONII HUME.

W. A. KELLERMAN.

In default of guiding clues random cultures were made in 1903 with the teleutospores of *Puccinia thompsonii* Hume, a widely occurring rust on *Carex frankii*, but no success attended the attempted inoculations. Suspecting a possible connection with the Aecidium of the Elder, *Sambucus canadensis*, and noting the strong morphological resemblance between this species and the forms previously described as *Puccinia bolleyana* by Saccardo (1891) and *Puccinia atkinsoniana* by Dietel (1897),¹ attempted inoculations were renewed the present season.

Partially successful results were at first discredited in spite of the strong suspicion entertained that the alternate form would prove to be none other than Schweinitz's *Aecidium sambuci*. At this time I communicated my suspicion to Dr. Arthur, also asking for good culture material in case he had any to share with me. He kindly returned answer at once, stating that *he had entertained such an opinion* for nearly two years as suggested above though he had no suitable teleutospores for inoculation.

I was fortunate enough to find a small quantity of the Rust that had been exposed all winter, in the vicinity of Columbus. Proceeding with great care, most satisfactory results were obtained in a few days, when several vigorous inoculated host plants of *Sambucus canadensis* were rendered fairly yellow with abundant spermogonia. In the usual time the plants exhibited the characteristic Elder aecidia — even the infection of pétioles and stems causing distortions resulted from the inoculations. The evidence could not be denied by the most skeptical and I can therefore with confidence assert that *Puccinia thompsonii* Hume is a synonym of *P. sambuci* (Schw.) Arthur.

It is interesting to note, after all, that the description given by H. Harold Hume in the Botanical Gazette, 29:352, May 1900, differs in no marked or striking degree from those of *P. bolleyana* and *P. atkinsoniana*. For example, the teleutospores are said to be "oblong clavate, 48-68 x 15-24 μ ," whereas in *P. bolleyana* they are given as "clavate-oblong, 45-55 x 20-25 μ ," and in *P. atkinsoniana* as "mostly clavate, 40-60 x 18-28 μ ." It is said [l. c.] that this species, *P. thompsonii*, "somewhat resembles *P. bolleyana* Sacc., but differs from it in the more scattered, larger, oblong, lighter-colored sori and the somewhat longer and narrower spores." Doubtless the slight discrepancies in the three descriptions are referable to conditions or phases of a temporary character or minor importance.

¹These were pronounced by Arthur to be one and the same species and the name *Puccinia sambuci* (Schw.) Arthur was applied. Cfr. Bot. Gaz. 35:15. Jan. 1903.

For convenience of reference the accepted name and synonymy may here be summarized.

PUCCINIA SAMBUCI (Schw.) Arthur. Bot. Gaz. 35:15. Jan. 1903.

Accidium sambuci Schweinitz. Trans. Am. Phil. Soc. Philadelphia, 4:294. 1834.

Puccinia bolleyana Saccardo. Am. Mon. Micr. Jour. 10:1 (fig.) Aug. 1889. Sylloge Fungorum, 9:303 (descr.) 15 Sept. 1891.

Puccinia atkinsoniana Dietel. Bull. Cornell Univ. (Science), 3:19. June 1897.

Puccinia thompsonii Hume. Bot. Gaz. 29:352. May 1900.

ELEMENTARY MYCOLOGY.

(Continued.)

W. A. KELLERMAN.

ORIGIN OF LIVING MATTER. — The doctrine that individuals invariably arise from previously existing organisms was scientifically established the latter part of the century just closed. It had been previously supposed that some of the simple plants and animals, even some of the more complex organisms also, arose by "spontaneous generation"; *i. e.* that they were formed, often in great abundance, under favorable circumstances, directly out of inert or lifeless (mineral) matter. The experiments of some investigators seemed to prove the truth of such an hypothesis. But the classic work of Pasteur, and especially the crucial experiments of Tyndall, and Huxley, completely demonstrated the fallacy of such supposed spontaneous origin. They showed that new individuals appeared only when there were present the "germs," ova, spores, or seeds, derived from parent forms. The continuity of life is a proposition tenable not only for the existing races of plants and animals, but it is in the same manner demonstrated as well for the entire period of organic existence on our globe from early geologic time. Exactly when or how in archæan time living organisms began, no definite knowledge is at hand and no satisfactory hypothesis has been promulgated. Modern scientific research has clearly indicated that the old view of a radical (fundamental) difference between what is termed mineral or "inert" matter and organic or so-called "living" matter, is irrational. It is, moreover, highly probable that living matter, that is to say, organisms — a common though indefinite synonymous term is "*life*" — began to exist in an orderly natural way. Neither is it a gratuitous assumption, or fallacy, groundless, that organisms may have been in existence previous to the time when our globe was yet untenable by even the lower plants and animals. The

facts lending support to this view are, that some organisms are to-day flourishing in media of great extremes of temperature — for example in thermal springs and in arctic regions. Again, seeds subjected for a time to a temperature of 250° C. below zero do not all lose their vitality and they doubtless are more sensitive to an untoward environment than less complex structures would be; but this is approximately the coldness of interplanetary space, and would suggest that ultra-imported living matter might have been the starting point for mundane organic existence.

VEGETATIVE REPRODUCTION. — Whatever the facts may prove to be in regard to the origin and continuity of living matter, the orderly (natural) rôle of multiplication of individuals at the present time is recognized and the processes involved in reproduction are, in a measure, understood. Leaves or portions of leaves of *Begonia* are placed in moist sand, whereupon they develop buds and shoots; and thus the florist obtains a new set of individual plants. Willow twigs, elder, etc., partially covered with moist soil may grow into so-called new individuals. Cuttings of very many ornamental or useful plants are used to provide the desired number of new individuals. Fragments of roots or portions of stems may in some cases be similarly used. In other cases such structures as runners, stolons, offsets, and bulbs are employed. The “artificial” multiplication of useful plants, particularly the various kinds of fruit trees, is secured by means of “budding” and “grafting,” *i. e.* by the use of buds or twigs taken from the particular individuals or kinds which it is desired to perpetuate, and inserting on seedling plants, readily grown in great quantities, of similar (or closely related) species. In nature we see extensive vegetative multiplication by “sprouts” that develop from adventitious buds arising on roots; runners, stolons, or bulbs, may develop new plants at varying distances from the parent. Another mode of rapid and extended multiplication is seen in case of creeping underground stems which are called *rhizomes*; a large number of the Grasses and many other perennial herbaceous plants, including some of the Ferns, are common illustrative examples. The unicellular plants, as some of the Algae, the Bacteria, and many of the Fungi, multiply by a division of the cell into two equal parts, each of which is therefore a new individual (Fig. 2). The Yeast-plant increases by a process that is called “budding.” (Fig. 4.) Here a small portion grows out from the parent cell, gradually enlarges and exhibits the usual elliptical shape; presently it may give rise to others and ultimately all may become detached. In some of the filamentous Algæ the cells divide repeatedly, and then fragments of the parent individual separate and these behave thereafter as new and independent plants. Larger or smaller portions of the ordinary or specialized vegetative cells in plants of still higher groups become detached and these continue an independent exist-

ence. The parts detached may be very small and simple in structure or they may be more complex and even highly differentiated. Illustrative examples are "*soredia*" in the Lichens, the "*gemmae*" in Liverworts and Mosses, "*hibernacula*" in Water Milfoil, *bulblets* in many plants, also *viviparous* inflorescences. The term *vegetative reproduction* is applied to all of the enumerated cases; it is the single cell, or the mass of cells, which is directly concerned in the vegetative processes of nutrition and growth that — still retaining (at least in large part) the normal functions — gives origin to the new individuals.

SPORE REPRODUCTION.—All or the great majority of cells in plants may be said to be nutritive in function; that is, they are or have been concerned, directly or indirectly, in the ordinary processes of nutrition and growth. But a cell may become physiologically differentiated for quite another purpose; it may lose its nutritive function entirely and all of its energies become set to the direct or indirect production of a new individual. Such a cell, having taken on a reproductive function, is called a *spore*. An example common and easily examined is furnished by the Leaf Mildew of the Lilac. The elongated vegetative cells (*hyphae*) creep over the surface, sending suckers (called *haustoria*) into the epidermal cells of the host for nourishment. Presently some of the *hyphae* grow erect and near the end of such an upright *conidiophore* (as it is termed) constriction of the wall takes place; this deepens and finally the terminal portion is wholly abstricted; such a reproductive cell, or a sexual spore, is called a *conidium*

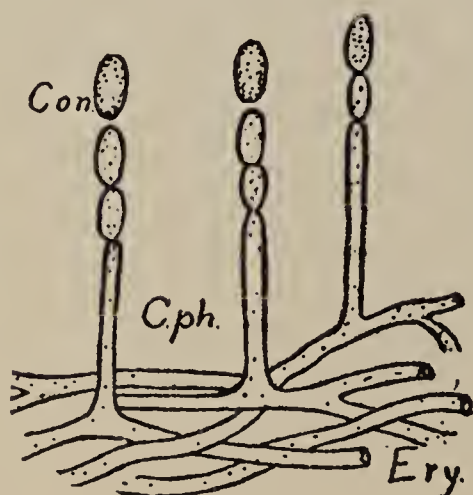


FIG. 7.

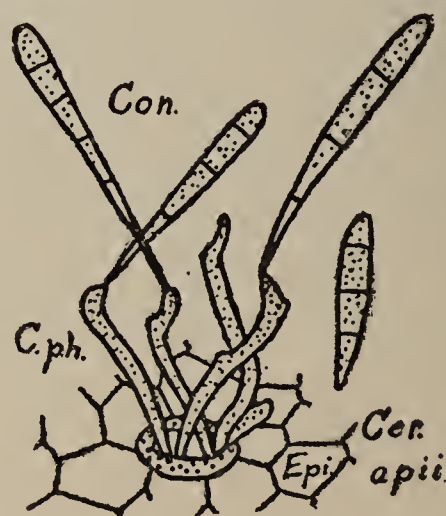


FIG. 8.

FIG. 7. Hyphae of a Leaf Mildew (*Ery.*), with conidiophores (*C.ph.*) abstricting conidia (*Con.*). The fungus grows on the surface of the leaf.

FIG. 8. Hyphae (*C.ph.*) of the Celery Leaf-spot fungus, *Cercospora apii* (*Cer. apii.*), emerging through the stomate of a leaf and bearing Conidia (*Con.*).

(Fig. 7). Other conidia are successively abstricted from the same conidiophore, which is true not only for this species but also for all the Leaf Mildews. In case of some of the Fungi only one conidial spore is formed by each conidiophore. In the Grape Mildew (Powdery Mildew) the conidiophores emerge from the stomate of

the leaf; they branch extensively and on each ultimate tip a conidium is produced (Fig. 5). Other forms of conidiophores and conidia are found in various fungi (as "White Rust" of Shepherd's purse (Fig. 14); and the Leaf-spot, or *Cercospora* of Celery (Fig. 8). In case of the large group of Fungi to which the Toadstools belong, the spores are borne on little pedicels (called *sterigmata*) that arise from a large cell which is called a basidium

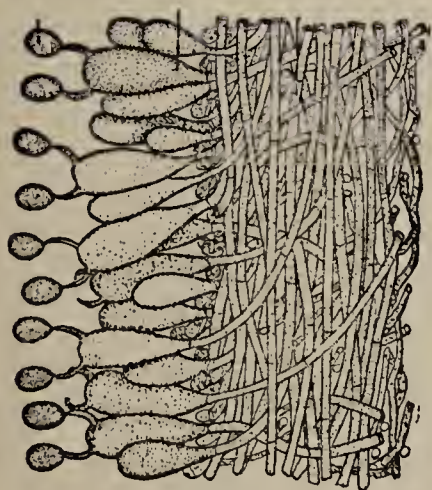


FIG. 10.



FIG. 11.

FIG. 10. A small section from the gill of an Agaric, or Mushroom, showing the hyphæ that terminate in Basidia which bear the spores.

FIG. 11. Hyphæ of the Mucor, or the common Black Mould, producing conidiophores that bear the conidia in receptacles at the apex.

(Fig. 10). Quite a different type of spore formation is seen in the common Black Mould. Here the sporophores are erect and develop within the enlarged terminal cell a multitude of conidia (Fig. 11). In other cases, for example, the fresh-water Alga called *Oedogonium*, the entire mass of protoplasm in a cell becomes a spore, develops cilia, *i. e.*, protoplasmic lashes or locomotive organs, and after escaping from the ruptured wall of the parent cell, swims about for a short time previous to permanent settlement and development into a filamentous form like the individual from whence it sprang. In case of *Ulothrix*, another of our common Algae, the protoplasm in a single cell becomes fragmented into two or many ciliated individuals, or swarm spores, which likewise are very active immediately upon their escape. When they come to rest their cilia disappear and soon a filament of the usual type is developed (Fig. 12).

SEXUAL REPRODUCTION.—It is not always the case that the single reproductive cell develops into the usual parent form; instead, it often unites with another like or unlike cell and the result of this union is the spore—the so-called *sexual-spore*, which then at once, or after a resting period, gives rise to the new individual. The essential feature of this process, sexual reproduction, is the fusion of the two nuclei of the *gametes*—as the two conjugating masses are called. The mechanism of the process is various in various groups of plants, but only a few illustra-

tions need be here given. For example, the common Black Mould, or Mucor, besides producing conidial spores is sometimes seen

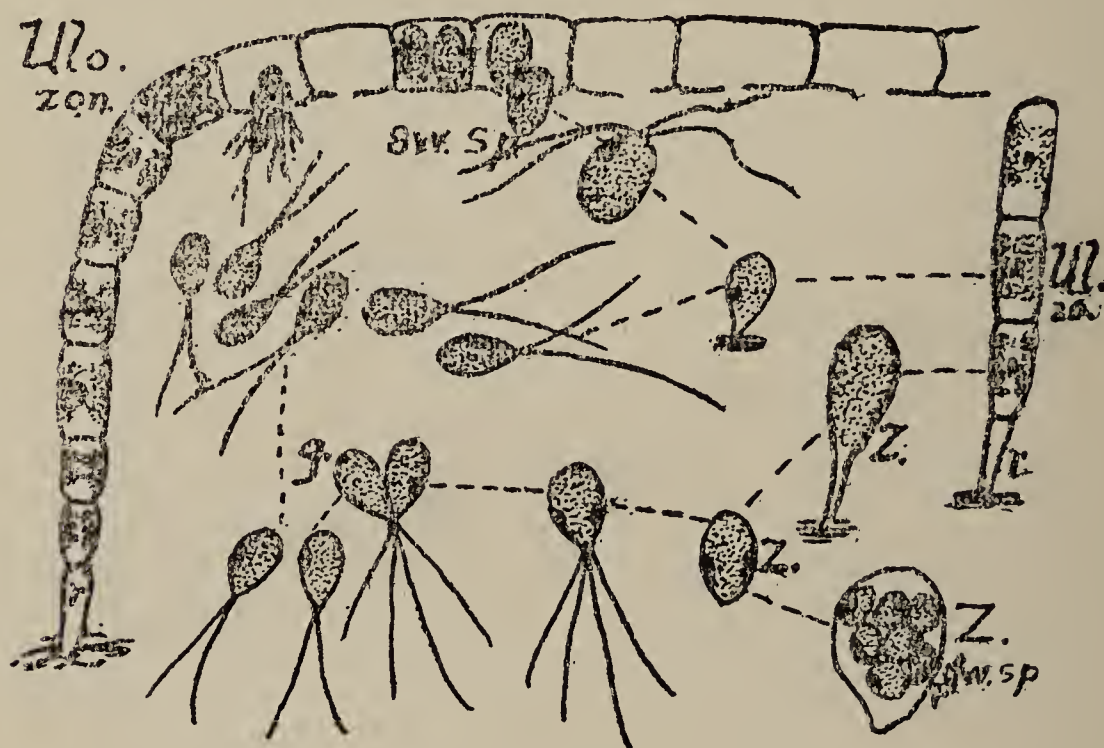


FIG. 12.

FIG. 12. *Ulothrix zonata*, a common fresh-water Alga, attached by a rhizoid (r), producing zoospores. The large swarm spores (sw. sp.) have four cilia. The smaller swarm spores have two cilia; in some cases they are gametes (g.) *i. e.* fuse to form a zygospore (z.). The zygospore may in turn produce swarm spores which grow into the usual form of the species; or the zygospore may develop, as many swarm spores do, directly into a plant like the ordinary filamentous form (U. zo.).

to produce sexual spores as follows. Two more or less differentiated hyphae give rise by the stimulus of contact to swollen portions each of which near the point of contact forms a septum



FIG. 13.

FIG. 13. Zygospore formation in the *Mucor*, or common Black Mould. An early stage of the gametophores is shown at *a*; the cells are becoming enlarged at *b*, and at *c* the gametes are formed; fusion is shown at *d*, and the mature zygospore is represented at *e*.

thus producing the two gametes. The common wall of these cohering cells becomes absorbed and the contents fuse into one mass and thus a single spore, *i. e.*, a sexual spore, is formed (Fig. 13).

To this is given the name of *zygospore* (yoke spore) because formed of two similar gametes. In case of some of the Mildews, the Albugo ("White Rust") of the Shepherd's purse, etc., the sexual process differs from the above mainly in the fact that the two parts or organs producing the gametes are quite unlike each

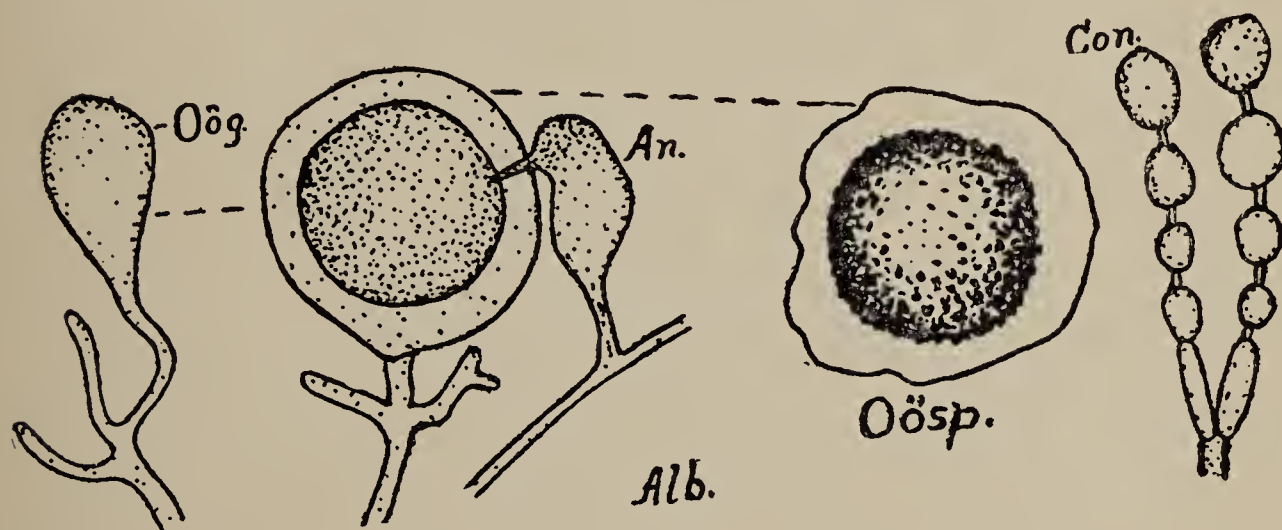


FIG. 14.

FIG. 14. Oospore formation in the so-called "White Rust" of the *Conciferæ*, *Albugo candidus* (Alb.). Conidia (Con.) of this species are also shown at the right. An early stage of the Oogonium (Oog.) is figured, followed by its fertilization by the Antheridium (An.). The mature Oospore is represented (Oosp.).

other (Fig. 14). The larger, or *egg-cell*, is designated as the *oogonium*, and the smaller one, or *sperm-cell*, is called the *antheridium*. The sexual spore in this case is called the *oospore*. The spore may have, in case of other groups, a mass of adjacent cells more or less completely enclosing it, developed simultaneously with the fusion of the nuclei or immediately before or after, the resulting structure suggesting a fruit — and hence such spores are called *carpospores*.

THE EVOLUTION AND PURPOSE OF SEXUALITY.—An examination of the probable origin of sexual reproduction in the vegetable kingdom may possibly indicate its purpose or advantages. Reference has already been made to swarm-spores — protoplasmic bodies destitute of a cell wall and furnished with a cilium, or two or more cilia, that serve the purpose of locomotion through water. When these zoöspores escape from the parent cell they swarm vigorously for an hour or more and then come to rest. Now it might happen occasionally in such apparently aimless motions that two of the cells would collide, perhaps fuse, and thenceforth act as a single cell; such has actually been observed to take place. That it merely "happens" so is indicated by the fact that most of the cells do not so collide and fuse, but each nevertheless develops independently into a new plant. If now anything in the way of vigor or other qualities proves valuable in such fortuitous union, the union of energies (that could never be *absolutely identical* in two separate masses!) might be a great

advantage, its results would be a positive gain to the race; it would therefore likely be perpetuated and the process become (by "selection") fixed and common. The fact that in some plants fusion of "swarm spores" is the rule, and that in the higher plants the gametes are brought together by aid of highly specialized structures suggests the correctness of this interpretation of the origin, and at the same time is probable proof of the advantages of sexual union.

VIEW POINTS IN SCIENCE.—The countless multitudes of plants and the endless variety in form and structure baffles an adequate comprehension of the Vegetable Kingdom. To understand, even in a general way, our common herbs, shrubs, and trees, we need to know their gross and minute structure, the relation and derivation of the organs and other specialized structures, their mode of living or physical and chemical energies displayed in growth, their relation to the environment in which they live, their reaction when untoward exigencies arise, their individual and their race development. Any one of these several *View Points* may for a time be made prominent; and a mass of knowledge—often more or less crude and quite insufficient—has already accumulated relative to each, and for which a technical designation is employed. Naturally the first phase to engage attention is the mere external form, and examination of the parts or organs presented—hence the term *Gross Anatomy*. With the aid of a microscope the minute anatomy can be determined satisfactorily so far as this instrument is able to reveal it. The masses of various kinds of material of which the organism is composed are called tissues; therefore the word *Histology* is used—the Greek word *histos* meaning tissue. But the various kinds of tissue in the plant-body and the organs presented may be studied with reference to their origin and mode of differentiation, and especially as to their fundamental relationship,—such a study is called *Morphology*. It includes an examination of the tissues and organs in *the act of development and differentiation*. It should therefore give us a correct interpretation of the parts of a plant and a clue to its meaning as a whole. When this developmental history is traced from the egg and carried through the remarkable changes in the early stages it is called *Embryology*. Structures that in the adult or mature form may be quite different in appearance or function may have been derived from the same, *i. e.* fundamentally corresponding, parts of the organism; they would then be said to be *homologous*. Thus the floral leaf—*e. g.* the stamen—is homologous with the foliage leaf; the panicle—*e. g.* the head of oats—is homologous with the Sunflower; the Fern leaves with their sporangia ("fruit") are homologous with the stamen and pistil in the Rose; the spore in the Lower plants is homologous with the cell from which the embryo in the seed of the higher plants develops. *Homology*—as this phase of

science is called — suggests a fruitful field of study in interpreting the apparently chaotic multitude of forms and structures.

PHYSIOLOGY.—The Point of View may not be primarily in relation to structure, but rather to the display of energy in the organism — in other words — its *Physiology*. This branch of science is therefore immediately concerned with such problems as — how the organism secures materials for food, the manner of breaking up chemical compounds into their elements and the recombination of these to form organic material, the various changes indicated by such terms as digestion, assimilation, respiration, as well as the protoplasmic reactions of all kinds displayed by the organism and the work it performs. Physiology has primarily to do with function rather than structure. But an organism may be studied as a whole or as a unit of energy, rather than in reference to the several phases of more or less intricate action displayed within the individual; its reaction to the medium in which it lives, its adaptation possibly to a slowly changing, or perhaps a more or less unfavorable environment, its behavior when untoward exigencies arise, or when other individuals or other objects or any external phenomena directly affect it; — these and other related topics are included under the head of *Ecology*. Ecological relations of plants are most intimately connected with their physiology — in fact Ecology might be considered one of the subdivisions of Physiology.

PHYTOPATHOLOGY.—Yet another relation should be mentioned, namely, that under which the untoward circumstances injuriously affect the individual. For example, a parasitic fungus may attack a leaf, or fruit, or stem or root, and interfere with its normal functions — ultimately, it may be, destroy the part or even the whole plant; a soil too rich in plant food or with deficient amount of one or more of the necessary food elements, or with insoluble compounds, may prove disastrous to the plant; or, again, mechanical influences may injuriously interfere with growth or cripple the organism; in all such cases pathological, or so-called diseased, conditions ensue. A study of the plant with special reference to such phases has developed a subdivision of Botany to which the name of *Phytopathology* has been appropriately given. When it is recalled that there is an enormous number of parasitic organisms — Rusts, Smuts, Leaf Mildews, Fruit-rots, Blights — that attack the cultivated plants, decreasing sometimes annihilating the crops, the practical importance of this branch of botany may be realized. The parasitic fungus may be microscopic in size and its presence known only by its disastrous effects; it may be wholly concealed within the tissue of the host — not always breaking through the epidermis even to liberate its spores; it may grow on the superficial cells though sending suckers into the epidermis of the host-plant for nourishment; it may be very simple in structure, even unincellular, or it may display consid-

erable differentiation; it may be polymorphic — that is, produce different kinds of spores in the different stages presented in the course of its life-cycle; the vast quantity of any one host-plant cultivated, as Wheat, Maize, the Potato, the Apple, the Grape, may afford practically unlimited food for the attendant parasite and so the destruction wrought would be almost incalculable. These facts not only indicate the importance of Vegetable Pathology, or Phyto-pathology, but suggest the very intimate relation of this subject with that of *Mycology*. The two can in fact be advantageously kept in mind in the future paragraphs of this elementary treatise.

INDEX TO NORTH AMERICAN MYCOLOGY.

Alphabetical List of Articles, Authors, Subjects, New Species and Hosts, New Names and Synonyms.

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(Continued from page 143.)

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- TILLETIA wilcoxiana Griffiths n. sp., on *Stipa eminens andersonii* Vasey. *Bull. Torr. Bot. Club*, 31:88. Feb. 1904.
- TOADSTOOLS, Three Edible. [*Coprinus micaceus*, *C. atramentarius*, *C. comatus*.] J. C. Arthur. *Ind. Agr. Exp. Sta. Bull.* 98:44-50. Pl. I-VII. Feb. 1904.
- TOBACCO Wilt, The Granville; a Preliminary Bulletin. [Caused by Bacteria.] F. L. Stevens & W. G. Sackett. *N. C. Agr. Exp. Sta. Bull.* 188:81-96.
- TOWNSEND, C. O. A fungus infesting stored Sugar. [*Penicillium*.] *Science*, N. S. 19:418. 11 Mar. 1904.
- TRACYLLA Fl. Tassi, n. n. [sub-genus *Tracylla* Sacc., *Leptothyrium*]. *Bull. Lab. Orto. Bot. Siena*, 6:62. 1904.
- TRACYLLA spartinae (Peck) Sacc. n. n. [*Leptothyrium spartinae* Peck.] *Bull. Lab. Orto. Bot. Siena*, 6:62. 1904.
- TREE-DESTROYING Fungi, *see Fungi, Some tree-destroying* . . .
- TREMATOSPHERIA clavispora E. & E. n. sp., on dead limbs of *Artemisia tridentata*. *Jour. Mycol.* 9:166. Oct. 1903.
- TRICHOLOMA, The Masked. [*T. personatum*. Popular.] Elizabeth Willis Woodworth. *Birds and Nature*, 14:191. Pl. 608. Nov. 1903.
- TRICHOLOMA radicans Peck n. sp., under coniferous trees. *N. Y. State Mus. Bull.* 67:22. 1903.
- TSUGA canadensis, decaying trunks, host to *Clavaria tsugina* Peck n. sp. *N. Y. State Mus. Bull.* 67:28. 1903.
- TUBERCLES, Root, of Bar Clover (*Medicago denticulata* Willd.) and Some other Leguminous Plants. G. J. Pierce. *Proc. Calif. Acad. Sci.* 1902, Ser. 3, 10:295-328. 1902..

- TYLODON *friesii* Banker n. n. [*Radulum pendulum* Fr.] Bull. Torr. Bot. Club, 29:441. July 1902.
- ULMUS, *see Elm* . . .
- UNPUBLISHED work, *see Fungi, An interesting* . . .
- URNULA *terrestris* (Niessl.) Sacc. [identical with *Melachroia xanthomela* and following Schroeter must be called *Podophacidium xanthomelan*. Kupfer.] Bull. Torr. Bot. Club, 29:143. March 1903.
- Discard "*Uredineae, Cultures of, in 1903. J. C. Arthur. Bot. Gaz. 35:10-23. Jan. 1903*"; and substitute the following:
- UREDINEÆ, Cultures of, in 1902. J. C. Arthur. Bot. Gaz. 35:10-23. Jan. 1903.
- UREDINEÆ, Cultures of in 1903. J. C. Arthur. Jour. Mycol. 10:8-21. Jan. 1904.
- UREDINEÆ, New Species, — III. J. C. Arthur. Bull. Torr. Bot. Club, 31:1-8. Jan. 1904.
- UREDINEOUS Culture Experiments, Index to, *see Index* . . .
- UREDINEOUS Infection Experiments in 1903. W. A. Kellerman. Jour. Mycol. 9:225-238. Dec. 1903.
- UREDINOPSIS *copelandi* Syd. n. sp., in frondibus vivis *Athyrii cyclosori*. Ann. Mycolog. 2:30. Jan. 1904.
- UREDOPASADENÆ Syd. n. sp., in foliis vivis *Arctosaphyli patulæ*. Ann. Mycolog. 2:31. Jan. 1904.
- UREDOPASADENÆ Syd. n. sp., in frondibus vivis *Gymnogrammis triangularis*. Ann. Mycolog. 2:31. Jan. 1904.
- UREDOPASADENÆ Syd. n. sp., on *Fimbristylis spadicea* Vahl. Bull. Torr. Bot. Club, 31:5. Jan. 1904.
- UROMYCES *hellerianus* Arthur n. sp., on *Cayaponia racemosa*. (Sw.) Cogn. Bull. Torr. Bot. Club, 31:2. Jan. 1904.
- UROMYCES *lespedezæ-procumbentis* (Schw.) Curt. [Successful cultures — *Aecidium leucospermum* B. & C. obtained—with teleutospores from *Lespedeza capitata* Mx. applied to same host. Arthur.] Jour. Mycol. 10:14. Jan. 1904.
- UROMYCES *pavoniæ* Arthur n. sp. on *Pavonia racemosa* L. Bull. Torr. Bot. Club, 31:1. Jan. 1904.
- UROMYCES *phaseoli* (Pers.) Wint. [Successful cultures — *spermogonia* and *æcidia* obtained—with teleutospores from *Strophostyles helvola* (L.) Britt. (*Phaseolus diversifolius* Pers.) applied to same host. Arthur.] Jour. Mycol. 10:16. Jan. 1904.
- UROMYCES *solidagini-caricis* Arthur n. n. [*Uromyces perigynius* Halst. (?)] Jour. Mycol. 10:16. Jan. 1904.

- UROMYCES solidagini-caricis Arth. n. n. [Successful cultures — spermogonia and æcidia obtained — with teleutospores from *Carex varia* applied to *Solidago canadensis* L., *S. serotina* Ait., *S. flexicaulis* L., *S. cæsia* L. Arthur.] Jour. Mycol. 10:16. Jan. 1904.
- USTILAGO calcara Griffiths n. sp., on *Bouteloua breviseta* Vasey. Bull. Torr. Bot. Club, 1:85. Feb. 1904.
- USTILAGO lycuroides Griffiths n. sp., on *Lycurus phleoides* H. B. K. Bull. Torr. Bot. Club, 31:84. Feb. 1904.
- USTILAGO scolochloæ Griffiths n. sp., on *Scholochloa festucacea* (Willd.) L. Bull. Torr. Bot. Club, 31:86. Feb. 1904.
- USTILAGO strangulans Tssat. [Abundant on *Eragrostis neo-mexicana* in Arizona, Griffiths.] Bull. Torr. Bot. Club, 31:87. Feb. 1904.
- VALSA (?), old, host to *Helotium parasiticum* E. & E. n. sp. Jour. Mycol. 9:165. Octo. 1903.
- VALSELLA minima Niessl. [Description from specimen on *Sambucus canadensis*; Ellis & Everhart.] Jour. Mycol. 9:167. Oct. 1903.
- VERRUCARIA fulva Cummings n. sp., on rocks and on moss. Alaska, Har. Exped. 5:71. Pl. VII. 1904.
- VIOLA langsдорffii Fisch., see *Puccinia fergussoni* B. & Br. Bull. Torr. Bot. Club, 31:2. Jan. 1904.
- VIOLA orbiculata Geyer, host to *Puccinia canadensis* Arthur n. sp. Bull. Torr. Bot. Club, 31:2. Jan. 1904.
- WEST American Smuts, see *Smuts, Concerning some* . . .
- WESTERN Yellow Pine, see *Pinus ponderosus* . . .
- WHETZEL, Herbert H. A New Method of Mounting superficial Fungi. Jour. Mycol. 9:218-9. Dec. 1903.
- WILCOX, E. Mead. A leaf-curl Disease of Oaks. [Taphrina coerulescens.] Ala. Agr. Exp. Sta. Bull. 126:171-187. Oct. 1903.
- WILLIAMS, T. A. Lichens. [List of 10 species.] Pl. Bakerianæ, 2:30-1. 25 March 1901.
- WILT Disease, see *Disease, Wilt* . . .
- WILT, see *Tobacco Wilt, The Granville* . . .
- WITHERTIP and other Diseases of Citrus trees and fruits, see *Diseases, Withertip and* . . .
- WOOD, decaying, host to *Polyporus cowellii* Murrill n. sp. Bull. Torr. Bot. Club, 31:40. Jan. 1904.
- WOOD, host to *Polyporus maculosus* Murrill n. sp. Bull. Torr. Bot. Club, 31:41. Jan. 1904.
- WOODS, A. F. Bacterial Spot, a new disease of Carnations. Science, N. S. 18:537-8. 23 Oct. 1903.

- WOODWORTH, Elizabeth Willis. The Chantarelle. [*Cantharellus cibarius*. Popular.] *Birds and Nature*, 14:143. Pl. 600. Oct. 1903.
- WOODWORTH, Elizabeth Willis. The Glistening Coprinus. [Popular. *C. micaceus*.] *Birds and Nature*, 14:235. Pl. 616. Dec. 1903.
- WOODWORTH, Elizabeth Willis. The Masked Tricholoma. [*T. personatum*. Popular.] *Birds and Nature*, 14:191. Pl. 608. Nov. 1903.
- ZYGADENUS elegans, host to *Puccinia grumosa* Syd. et Holw. n. sp. *Monogr. Uredin.* 1:641. 1 Nov. 1903.

NOTES FROM MYCOLOGICAL LITERATURE. XI.

W. A. KELLERMAN.

THE ARTICLES PUBLISHED IN THE BULLETIN DE LA SOCIÉTÉ MYCOLOGIQUE DE FRANCE, tome XX, 1er Fascicule, are as follows: Boudier, Sur un nouveau genre et une nouvelle espèce de Myrangiées le *Guilliermondia saccoboloides*, Note sur une forme stérile du *Dryodon erinaceum*; Vuillemin, Le *Spinalia radians*, g. et n. sp. et la Série des Dispirées; Prillieux, sur la déhiscence des périthèces du *Rosellinia necatrix* (R. Hart.) Berlese; Souché, Sur la *Cantharellus cibarius* Fr., forme *C. neglectus*, et Enquête sur les cas d'empoisonnements par des champignons.

CHARLES THOM DESCRIBES A NEW SPECIES OF THELEPHORACEAE. — *Craterellus taxophilus* — in the March No. of the Botanical Gazette, 1904. The fruiting body is only 14-18 mm. high and grows on moist rotten leaves and twigs under *Taxus canadensis*; collected in Fall Creek gorge, Ithaca, N. Y., November 1903.

S. KUSANA PUBLISHES NOTES ON THE JAPANESE FUNGI, Uredineæ on *Sophora*, in the Botanical Magazine, 18:1-6, Pl. I, 20 Jan. 1904, calling special attention to two species of *Uromyces* (*U. truncicola*, and *sophorae-japonicae*) on *Sophora japonica*. This host is a native species of Japan, but widely cultivated as an ornamental tree, and should these Rusts attack our trees as vigorously as they do in Japan, their beauty and value would be seriously encroached upon. The first species named causes the canker growth of the tree, but the second attacks only the foliar organs.

FLORA, 92. BAND, JAHRGANG 1903, contained important mycological articles as follows: S. I. Keno, Die Sporenbildung von *Taphrina*-Arten; Const. von Deckenbach, *Coenomyces consuens* nov. gen. nov. spec. Ein Beitrag zur Phylogenie der Pilze; W. Rothert, Die Sporen Entwicklung bei *Aphanomyces*.

F. D. CHESTER AND C. O. SMITH REPORT IN BULLETIN 63, DEL. AGR. EXP. STA. Feb. 1, 1904, under Notes on Fungous Diseases in Delaware, some inoculation experiments with spores from pure cultures of *Colletotrichum lindemuthianum* applied to Cucumber, Pumpkin, Squash, Muskmelon, Watermelon, and Bean, successful on the last host only. Their conclusion is therefore opposed to that of Dr. Halsted (cf. N. J. Exp. Sta. Rep. 1893, 347-353) who seemed to prove that *C. lindemuthianum* and *C. lagenarium* were interchangeable on the fruits of bean and watermelon, these authors regarding the fungi under consideration as two distinct species.

BRUCE FINK HAS FURNISHED DESCRIPTIONS WITH SOME ILLUSTRATIONS, of twelve varieties of *Cladonia fimbriata* which are either rare in North America or of their distribution little is known. See the *Bryologist*, 7:21-7, Pl. III, March 1904. Dr. Wainio examined the abundant material furnished by Professor Fink, and the varieties are presented according to that lichenologist's Monograph of the genus *Cladonia*. By giving figures of our more common forms with the descriptions, says the author, it is hoped that the student of Lichens will not confuse the varieties and assign them to other species so frequently as has been done in the past.

FL. TASSI PUBLISHES SEVERAL NEW GENERA AND MANY NEW NAMES, many of them pertaining to North American Sphæropsi-deae, in *Bullettino del Laboratorio ed Orto Botanico di Siena*, Anno Quinto, Fascicolo I-III, 1902, under the title, I generi *Phyllosticta* Pers., *Phoma*, Fr., *Macrophoma* (Sacc.) Berl. et Vogl. e i loro generi analoghi, giusta la legge d'analogia. The new genera proposed are as follows: *Phyllostictella*, *Ascochyella*, *Microdiplodia*, *Diplodinula*, *Stagonosporella*, *Stagonosporina*, *Phyllohendersonia*, *Hendersonulina*, *Camarosporellum*, *Hyalothyridium*, and *Gymnosphaera*.

ANOTHER DISEASE OF TOBACCO IS REPORTED BY F. L. STEVENS AND W. G. SACKETT, under the name of the Granville Tobacco Wilt, in N. C. Agr. Exp. Sta. Bulletin 188 (Sept. 1903) being a preliminary report, describing the case as studied in Granville County, N. C., illustrated by fifteen figures of the affected host and suggesting Bacteria as the cause of the trouble, the disease said to have spread largely through infected soil.

MYCETES SICULI NOVI DAGLI ATTI DELL' ACCADEMIA GIORNIA DI SCIENZE NATURALI IN CATANIA (Ser. 4. vol. XVII), by Dr. G. Scalia, contains descriptions of about a dozen new species. We note among them a new species of *Septoria* on *Solanum nigrum*, namely, *S. solani-nigri* Scalia. To species of *Solanum* heretofore have been referred the following *Septorias*: *S. dulcamarae* Desm.; *S. lycopersici* Speg.; *S. pseudo-quinia* Pat.; *S. solanicola* E. & E.; and *S. solanina* Speg.

A SUMPTUOUS VOLUME AND VERY IMPORTANT PUBLICATION ON ALASKAN CRYPTOGAMIC BOTANY, being the 5th of the Harri-man Alaska Expedition with coöperation of Washington Academy of Sciences, has just been issued by Doubleday, Page & Company, New York, 1904. It covers 424 pages, contains 44 plates both lithographic and heliotypic, and is devoted to the Fungi (Saccardo, Peck, and Trelease; pp. 11-62); Lichens (Clara E. Cummings; pp. 65-152); Algae (De Alton Saunders; pp. 163-250); Mosses (Cardot and Thériot; pp. 251-328); Sphagnum (Trelease; pp. 329-338); Hepaticae (Evans; pp. 339-372); Pteridophytes (Trelease; pp. 373-398). The introduction occupies pages 1-10, and the Index 399-424. The volume was prepared under the general direction of Professor Trelease. For review of parts pertaining to the Fungi, and the Lichens, see other paragraphs.

C. G. LLOYD'S MYCOLOGICAL NOTES No. 16, issued March 1904, contains an interesting account of his year's travel and study in Europe, with notes relative to several eminent mycologists, as Persoon, Romell, Elias Fries, Patouillard, Hariot, and Boudier. Five pages are devoted to a discussion, langue française, of the genus *Lycoperdon* in Europe; still another emphatic word on Nomenclature is added, and Notes on specimens in Fries' Herbarium.

BIRDS AND NATURE, AN ILLUSTRATED MONTHLY MAGAZINE, has published very good plates in color photography of some of the common Mushrooms. In Vol. 14, 1903, we note *Amanita* the Fly Mushroom, the Chantarelle, Glistening *Coprinus*, The Mushroom, the Green *Russula*, the Masked *Tricholoma*.

A BEAUTIFUL GOLDEN YELLOW *HYDNUM* has been described as *Hydnum earleanum* by D. R. Sumstine in the April No. of *Torrey* (1904). It is a resupinate form, spines 3-6 mm. long, golden yellow, on the under side of a decorticated log (*Ostrya virginiana*?), in Armstrong County, Pa.

ANNALES MYCOLOGICI, VOL. II, März 1904, contains the following articles: Milesi e Traverso, Saggio di una monografia del genere *Triphragmium*; Tranzschal, Ueber auf Grund von irrthümlicher Bestimmung der Nährpflanzen aufgestellte Puccinien-Arten; Sydow, Novae fungorum Species; Rehm, Ascomycetes Americae borealis, I; Diedicke, Fungi imperfecti aus Thüringen; Guilliermond, Sur le noyau de la levure; Sydow, Mycotheca germanica Fasc. III, IV; Saccardo, De diagnostica et nomenclatura mycologia, Admonite quaedam.

NEW SPECIES OF FUNGI, 16 species, are described in the Bulletin of the Torrey Botanical Club, April 1904, by Charles H. Peck. They are included in the genera *Lepiota*, *Tricholoma*, *Collybia*, *Russula*, *Clitopilus*, *Flammula*, *Agaricus*, *Marasmius*, *Clavaria* and *Helvella*. The type localities include the States of

Missouri, Illinois, California, District of Columbia, Colorado and Michigan. No less than four of these interesting species belong to the genus *Agaricus*.

CAROLYN W. HARRIS OUTLINES AND ILLUSTRATES THE LICHENS COLLEMA AND LEPTOGIUM in the May No. of the *Bryologist*, 1904. The two genera are described; and four species of the first and six of the last are enumerated. They are found in the same localities and common — readily separated by the amateur since the under surface of *Collema* is devoid of rhizoids but in *Leptogium* they are always present in some form.

P. MAGNUS IS THE AUTHOR OF AN INTERESTING PAPER, *Ein Weiterer Beitrag zur Kenntnis der Gattung Uredinopsis*, *Hedwigia*, 43:119-125, Pl. I-II, 24 Mar. 1904. The literary history of the several species is noted, and attention is called to the fact that *Uredinopsis americana* Syd. n. sp. *Ann. Mycolog.* 1:325, 1903, auf *Onoclea sensibilis* is the same thing as listed in Farlow's Host Index as follows:

SEPTORIA MIRABILIS Peck.

UREDO MACROSPERMA Cooke.

GLOEOSPORIUM PHEGOPTERIDIS Pass.

MELAMPSORA SCOLOPENDRII (Fckl.) Farl.

and should be designated as *UREDINOPSIS MIRABILIS* (Peck) P. Mag. (*U. americana* Syd.). A new species on *Aspidium thelypteris*, collected by Geo. F. Atkinson, at Ithaca, N. Y., is named *UREDINOPSIS ATKINSONII* P. Magnus, and still another from same locality and collector on *Osmunda cinnamomea* is given as *UREDINOPSIS OSMUNDAE* P. Magnus. Two lithographic plates illustrate the three species.

THE MYCOLOGICAL ARTICLES IN *HEDWIGIA*, BAND XLIII, HEFT 2, to be mentioned are: P. Hennings, *Zweiter Beitrag zur Pilzflora des Gouvernements Moskau*, *Fungi flaminenses a cl. E. Ule collecti*, and *Einige Pilze aus Japan (Anfang)* [three new genera described in these papers]; P. Magnus, *Ein Weiterer Beitrag zur Kenntnis der Gattung Uredinopsis*; Max Britzelmayr, *Cladonia furcata* Huds. und *squamosa* L. etc.

IN THE VERHANDLUNGEN DES BOTANISCHEN VEREINS DER PROVINZ BRANDENBURG, 45 Jahrgang, 1903 (issued 1904), we find the following Mycological articles: Staritz, *Beiträge zur Pilzkunde des Herzogtums Anhalt*; Sandstedt, *Rügen's Flechtenflora*; Lindau, *Beiträge zur Pilzflora des Harzes* [with description of *Holcomyces* Lindau n. g. and *Pycnostysanus* Lindau n. g. and several new species]; Jahn, *Vorläufige Uebersicht über die bisher in der Mark beobachteten Myxomyceten*; Jaap, *Verzeichnis der bei Triglitz in der Prignitz beobachteten Hymenomyceten*; Hennings, *Beitrag zur Pilzflora von Rheinsberg*.

BULLETTINO DEL LABORATORIO ED ORTO BOTANICO della Università di Siena, Anno VI. Fasc. I.-VI., includes: Origine e sviluppo delle Leptostromaceæ e loro rapporti con le famiglie affine, i consei trav. gr. (Fl. Tassi); Nuovi Micromiceti (Fl. Tassi); Micologia della Provincia senese 12a pubblicazione (Fl. Tassi); La Ruggine dei Crisantemi '*Puccinia chrysanthemi* Roze' (Fl. Tassi); Indice generale dei Volumi I.-VI.

FL. TASSI GIVES AN EXHAUSTIVE ACCOUNT OF THE LEPTOSTROMACEÆ, origin and development, in the Bull. del Lab. ed Orto Botan. della Università di Siena, 6:3-124, Pl. I-VI, 1904, the full title of the paper, which is printed in Italian, being Origine e Sviluppo delle Leptostromaceæ e loro rapporti con le famiglie affine. Notes are given of the various genera and species, also listed the material examined, a half dozen new forms or new names proposed, one new genus (*Giulia*), synoptical key to 26 genera, and table of the species with demonstrated or supposed connection with the *Ascomycetes*. The American species in the latter list, are *Crandallia juncicola* Ell. & Sacc. (to *Duplicaria acuminata* E. & E.), *Melasmium quercuum* Atks. (to *Rhytisma tostum* B. & C. (?), *Leptothyrella langloisii* (E. & E.) Sacc. (to *Asterina* sp..).

THE COSMOPOLITAN CHARACTER OF MOST SPECIES OF THE GASTEROMYCETES, many forms of which group have been so long known to botanists, suggests special attention to a list of eight species that were published as new by L. Hollos, in Vol. XIX. of Mathematische und Naturwissenschaftliche Berichte aus Ungarn. Mr. Lloyd has already noted his own opinion as to the *Geaster pseudostriatus* Hollos n. sp. — regarding it as *G. asper* Mich.; and *Geaster pseudolimbatus* Hollos n. sp. he identifies as *G. limbatus* Fr. Hollos' entire list is as follows: (1) *Geaster pseudostriatus*, (2) *G. hungaricus*, (3) *G. pseudolimbatus*, (4) *Calvatia tatrensis*, (5) *C. hungarica*, (6) *Lycoperdon hungaricum*, (7) *L. pseudocephæforme*, (8) *Bovista hungarica*.

THE NUOVI MICROMICETI BY FL. TASSI in the Bullettino del Laboratorio ed Orto Botanica della R. Università di Siena, 6:125-7, 1904, contains descriptions of eleven species. Of these one is American, namely, *Sphæropsis hamamelidih* Fl. Tassi, n. sp., *hab.* in cortice *Hamamelidis virginicæ*, Virginia, Amer. bor. 1903.

FREDERICK D. CHESTER TREATS EXHAUSTIVELY THE SUBJECT OF THE BACTERIOLOGICAL ANALYSIS OF SOILS in Bulletin 65, Delaware College Agricultural Experiment Station, March 1, 1904. We cite as an example of the species obtained from a sample of soil drawn May 11, 1903, from a grape vineyard, (this being a sandy loam and under good state of cultivation), the following: *B. ellenbachiensis* Caron, *B. tumescens* Zopf., *B. sp. indet.*, *B. alcalescens* Ford. An earlier analysis from experiment

station soil gave *Streptothrix soli* Chester, *B. tumescens* Zopf., *B. alcaligenea* var. *pulvinatus* Chester, *B. ellenbachiensis* Caron, *B. mycoides* Flügge, a brown *Streptothrix* sp. "The kinds of Bacteria in the soil seem to be an extremely fortuitous matter Numbers can be increased by the introduction of sufficient humus into the soil to form food for the bacteria, and by stimulating their growth by active tillage.

NEW GENERA OF FUNGI PUBLISHED SINCE THE YEAR 1900, WITH CITATION AND ORIGINAL DESCRIPTIONS.

COMPILED BY W. A. KELLERMAN AND P. L. RICKER.

(Continued from page 155.)

[Phycomycetæ]

PARASITELLA Bainier n. g. Mucoraceæ. Bulletin de la Société de France, 19:153. 30 April 1903.

"Parasitella simplex nov. gen et sp. nov.

"J'ai exposé deux photographies de cette plante à l'Exposition universelle de 1889 sous le nom de *Mucor parasiticus*. Les sporanges du *Parasitella* sont rares et solitaires. Leur petitesse les fait échapper à la vision directe. Il faut les chercher au milieu des filaments du mycélium aérien qui est très développé. Leur forme est ovale, mais leur grand diamètre est perpendiculaire au support. Ils sont aplatis de haut en bas. La membrane qui les entoure est finement grenue et renferme un très grand nombre de petites spores ovales. La columelle est sensiblement ovale. Chaque sporange est porté par un support relativement court qui diminue insensiblement de diamètre à partir de la base. Ce support se sépare d'un filament de mycélium aérien en formant le plus souvent un angle très aigu. On est prévenu de la présence de cette plante par l'apparition de petites masses blanches adhérents aux supports des autres mucors et analogues aux nodosités que forment les *Chaetocladium*.

"La formation de ces tubérosités est fort curieuse. Lorsqu'un filament de *Parasitella* vient au contact d'un filament de *Rhizopus* ou d'un support sporangifère de *Mucor Mucedo* par exemple, il se produit un renflement sur chaque filament en regard l'un de l'autre. Ces deux renflements sont d'abord ovales ou fusiformes et deviennent globuleux. Puis le renflement de la plante qui va être attaquée par le parasite donne naissance à des prolongements allongés, digitiformes, souvent divisés au sommet, qui emprisonnent comme dans une griffe le renflement du *Parasitella*. Ces prolongements augmentent en nombre et en volume en même temps que le renflement du *Parasitella* devient une sphère de plus en plus volumineuse. Celle-ci donne nais-

sance à de nombreux filaments dont quelques-uns portent des sporanges. Quelquefois même le support d'un sporage prend directement naissance sur ce renflement."

[Phycomycetæ]

PRACHTFLORELLA Matruchot n. g. Mucoraceæ. Annales Mycologici, 1:56. Jan. 1903.

"Si au contraire on veut, dans les formes à mycélium continu, différencier deux genres, comme dans les formes à mycélium cloisonné on différencie les deux genres *Oedocephalum* et *Gonatobotrys*, il y aura nécessité de créer un nom générique nouveau pour *G. microspora*. Je propose dans ce cas le nome de genre *Prachtflorella*, pour rappeler le nom du remarquable ouvrage (*Prachtflora*) où Corda a décrit et figuré le *Gonatobotrys simplex* type du genre. *Prachtflorella microspora* (Riv.) Matr. sera dès lors le dénomination à appliquer à l'espèce de Rivolta. rangée logiquement, et jusqu'à preuve du contraire, dans la famille des Mucorinées."

[Phycomycetæ]

PROABSIDIA Vuillemin n. g. [Type. *Mucor saccardoi* Oudemans.] Compte Rendus des Séances de l'Académie des Sciences, 136:515. 23 Feb. 1903.

"En dépit de ces altérations du mode de ramification des cystophores qui caractérise le genre *Absidia*, toutes ces espèces de *Tieghemella* concordent avec les *Absidia* par leur apophyse en entonnoir dans laquelle la columelle s'effaïsse après la déhiscence et par la structure des spores. Le sporocyste garde les mêmes caractères chez le *Mucor Saccardoi* Oudemans, dont l'affinité avec les *Absidia* est attestée en outre par les zygosporos entourées de fulcres, bien que les pédicelles soient simples et qu'il n'y ait ni stolons ni rhizoides. Nous avons récemment créé pour le *Mucor Saccardoi* le nouveau genre *Proabsidia*."

[Phycomycetæ]

PROTASCUS Dangeard n. g. Saprolegniaceæ. Comptes Rendus des Séances de l'Académie des Sciences. 137:627. 9 Mar. 1903.

"Le thalle adulte a la forme d'une bouteille placée dans l'axe de l'hôte; le col très allongé se recourbe pour venir perforer la paroi de l'Anguillule; assez rarement, le thalle est composé de plusieurs articles semblables.

"Au début de sa croissance, le parasite est constitué par un cordon de protoplasme ne renfermant qu'un seul noyau; le nombre des éléments nucléaires augmente rapidement par téléomitose et le sporange contient finalement 8, souvent 16, parfois 32 noyaux Le sporange, au lieu de donner naissance à des zoosporos, comme on serait en droit de s'y attendre, fournit, en même nombre que les noyaux, de très longues spores immobiles; elles ont la forme de petites massues et leur orientation dans

le sporange est constante; l'extrémité renflée est toujours placée du côté du col.

"La sortie de ces pores a lieu par projection brusque: elles . . . arrivées au contact d'autres Anguillules se fixent à la paroi par leur extrémité amincie; une vacuole se montre à l'autre extrémité renflée; . . . elle y forme ce cordon uninucléé qui est le début du thalle ainsi que nous l'avons vu."

"Uar sa forme et sa structure, ce champignon est voisin des *Lagenidium* et des *Myzocyttium*."

[Phycomycetæ]

PSEUDO-ABSIDIA Bainier n. g. Mucoraceæ. Bulletin de la Société Mycologique de France, 19:155. 30 April 1903.

"Pseudo-Absidia vulgaris nov. gen., sp. nov.

"*Absidia* dubia (Thèse sur les Mucorinées).

"Le *Pseudo-Absidia* se trouve en été sur le crottin de cheval presque sec. C'est sur la racine de réglisse qu'on le cultive le plus aisément. Le sporange a la forme d'une sphère coupée un peu au-dessous de son centre et est revêtue d'une membrane lisse ou très finement grenue non déliquescente. La columelle, largement assise sur l'extrémité dilatée du support, a la forme hémisphérique ou bien encore d'un ovale coupé un peu au-dessous de la partie médiane; enfin, elle est sensiblement conique dans les petits sporanges.

"Suivant les variétés, les spores sont rondes ou ovales. Le support du sporange, largement dilaté en tronc de cône renversé, présente une coloration bleuâtre-violacê, d'abord faible, puis très nette à l'endroit où commence la dilation pour remonter jusqu'au sponge; cette coloration se manifeste également sur la columelle, mais avec moins d'intensité. Ce support est droit ou recourbé suivant les variétés, mais ne présente jamais de cloisons. Les ramifications se composent quelques fois tout simplement de branches secondaires isolées nées de distance en faisant un peu moins qu'un angle droit et terminées assez brusquement par un sporange. Mais, le plus souvent, au lieu d'une seule branche, du même point au-dessous du sporange terminal, naissent de trois à cinq branches secondaires terminées chacune par un sporange et formant un verticille. Ces branches peuvent, à leur tour, former autant de verticilles secondaires.

"La plante est stolonifère, mais les stolons s'obtiennent difficilement. On ne les rencontre que dans les cultures sur crottin de cheval presque sec. Ils se forment sur les bords de la soucoupe en terre poreuse qui contient le substratum. Un long filament donne des crampons radiciformes à son extrémité et se fixe sur les parois du vase; bientôt les filaments fructifères isolés ou réunis par deux ou trois se dressent comme chez l'*Absidia coerulea* sur le sommet de la courbure en un point très voisin des crampons. Mais chaque support porte toujours un verticille de sporanges.

“Les zygospores se rencontrent parfois dans les cultures sur crottin de cheval, dans la partie inférieure du substratum. Ce sont des sphères jaunes, convertes d'une membrane ayant tendance à s'écailler par plaques enformant des lignes irrégulières. Cette zygospore, portée par deux longs suspenseurs lisses, incolores et dépourvus d'appendices, présente souvent un caractère particulier. La membrane des cellules conjugué qui enveloppe le zygospore continue à s'accroître au point de soudure et fait saillie extérieurement pour former une sorte de méridien.”

[Phycomycetæ]

PSEUDOPERONOSPORA Rostowzew n. g. Peronosporaceæ. Flora oder Allgemeine Botanische Zeitung, 92:422,424. 6 Oct. 1903.

“Der falsche Mehлтаupilz, der auf der Gurke (Melone, Kürbis, Wassermelone u. a. Cucurbitaceæ) parasitiert, stellt eine besondere Gattung *Pseudoperonospora*, dar, die die mittlere Stellung im System zwischen den Gattungen *Peronospora* und *Plasmopara* findet. Die Konidienträger sind bei ihr ebenso gebildet wie die der *Peronospora*, aber die Konidien sind nach dem Typus der *Plasmoparakonidien* geformt.”

[Phycomycetæ]

PYRRHOSORUS Juel n. g. Chytridiaceæ. Bihang til Kongliga Svenska Vetenskaps-Akademiens Handlingar. Afd. III. No. 14, Band 26:14. 1901.

“Im vegetativen Zustand zuerst ein Plasmodium, das später in freie, elliptische oder spindelförmige, nackte, einkernige Zellen zerfällt. Sori aus grösseren, gerundeten Sporenmutterzellen mit eingemischten sterilen, spindelförmigen Zellen. Sporenmutterzellen nackt, von orangefarbenen Körperchen gesprenkelt, durch drei successive Zellteilungen in nackte Haufen von acht gerundeten Zellen geteilt, welche zu Zoosporen werden. Zoosporen birnförmig, einen orangefarbenen Pigment fleck enthaltend und mit zwei lateral befestigten, nach vorn und hinten gerichteten Cilien.”

[Phycomycetæ.]

RESTICULARIA Dangeard, emend. Fritsch. Ancylistaceæ. Annals of Botany, 17:661. Sept. 1903.

“Mycelium in part endophytic, in part ectophytic. Endophytic mycelium moniliform, with or without transverse septa, occasionally forming chlamydospores; ectophytic mycelium with or without septae, generally strongly branched and forming thin- or thick-walled spores. Other portions of the ectophytic mycelium act as infecting-hyphae. Sporangia formed in the endophytic mycelium, the contents of which are protruded to the outside through the wall of the host and there split up into a small number of zoospores, the latter rather large and uniciliate.”

[Phycomycetæ.]

RHABDIUM Dangeard n. g. Chytridiaceæ. Annales Mycologiques, 1:61, 30 Jan. 1903, also in Comptes Rendus de Séances de l'Académie des Sciences, 136:473. 16 Feb. 1903.

"Le thalle consiste en un filament qui est fixé sur la paroi de l'algue par sa base; celle-ci perfore la membrane et se met en contact avec le protoplasma par une sorte de disque. . . . Le thalle tout entier se transforme en un sporange, le nombre des zoospores est en général de seize La zoospore en liberté réniforme, elle possède un flagellum qui est traîné à l'arrière pendant le mouvement La zoospore se fixe sur la paroi de l'algue et presque aussitôt un prolongement perfore la membrane; la partie restée à l'extérieur s'allonge en un tube qui deviendra le sporange."

[Phycomycetæ]

RHIZOCLOSMATUM Peterson n. g. Chytridiaceæ. Journal de Botanique, 17:216. June—July. 1903.

"Rhizoclosmatium globosum n. gen. et nov. sp.; fig. 1, 2. "Les sporanges adultes ont une grandeur très variable, en moyenne environ 17-20 μ en diam. (souvent ils ont un diamètre 3-4 fois plus grand), sphériques; ils sont pourvus d'une membrane médiocrement épaisse, hyaline, lisse. Le mycélium est uni avec le sporange par une partie subsporangiale (un élargissement de la base du mycélium d'une forme variable. Le mycélium se compose de filaments très minces, fort ramifiés et longs, dont il est difficile d'observer les dernières ramifications; souvent ils périssent de bonne heure. Parfois le mycélium n'est si développé que le nom de *Rhizoclosmatium* l'indique. Les filaments et la partie subsporangiale ont un contenu réfringent et des parois très minces. Les zoospores ont 2-3 μ en diam.; elles sont ovoïdes ou sphériques et sortent une à une par une ouverture circulaire du sporange. Elles ont un flagellum très long traîné à l'arrière et un noyau avec un nucléole très distinct. Elles naissent vite pendant quelques minutes, puis elles deviennent immobiles et germent immédiatement en émettant la partie subsporangiale et le mycélium, tandis que la zoospore elle-même devient le sporange.

"Dans les sporanges jeunes, on voit des gouttes réfringentes, des vacuoles, et souvent des granules d'une couleur rubigineuse. Dans les sporanges adultes, les nucléoles seuls sont colorés. Des spores immobiles (fig. 2), provenant de sporanges transformés, se rencontrent rarement. Elles sont sphériques comme les sporanges et ont une membrane brunâtre très épaisse. Elles contiennent en petit nombre de gros granules réfringents."

[Phycomycetæ]

SIPHONARIA Petersen n. g. Chytridiaceæ. Journal de Botanique, 17:220. June-July 1903.

"Siphonaria variabilis n. gen. et n. sp.; fig. 11-17. Le thalle de cette espèce se compose de deux parties: le sporange et les

rhizoïdes; il n'y a aucun élargissement du mycélium à la base du sporange. Les sporanges adultes ont une forme très variable. Tantôt ils sont à peu près sphériques (fig. 11) avec une papille du côté de la base du mycélium, tantôt piriformes (fig. 13, 14,) quand cette papille devient grande, tantôt hémisphériques (fig. 12) ou réniformes avec une petite papille plus ou moins distincte, ou sans papille, près de la base du mycélium. Les sporanges ont par ex.: $17 \times 16 \mu$; $24 \times 21 \mu$; $20 \times 16 \mu$; $12 \times 11 \mu$ en diam. Ils ont des membranes minces, hyalines, lisses. Les parois des rhizoïdes sont relativement épaisses, en particulier à la base, d'où le mycélium prend un aspect très gros; et comme leur protoplasma est mince, elles ont l'air de tubes vides, d'où le nom de *Siphonaria*. Le mycélium est ramifié, mais beaucoup moins que dans les espèces précédents. Les zoospores sont nombreuses, $1-3 \mu$ en diam., uniciliées (?). Leur sortie du sporange se fait comme chez l'*Asterophlyctis*; quand le sporange demeure fermé, elles se comportent comme chez ce dernier. Elles sortent par la papille, latéralement, ou au bout, ou au côté de celle-ci. La zoospore émet en germant les rhizoïdes et devient elle-même le sporange. Les nucléoles des zoospores ont souvent la même couleur rubiginieuse que les zoospores du *Rhizoclostridium*; dans les sporanges jeunes on trouve ici comme là le pigment dans les nombreux petits granules. Les spores immobiles sont presque sphériques (de la grandeur des sporanges), moins souvent, chez les individus, piriformes, de la forme du sporange; elles sont des sporanges transformés. Leurs parois sont épaisses, lisses, brunâtres. Leur contenu est granuleux, incolore. Elles paraissent toujours réunies avec des rhizoïdes. A la phase d'enkystement on trouve ordinairement deux ou trois individus se fusionnant par leurs rhizoïdes (v. fig. 16, 17). Un ou deux de ces individus ont leurs sporanges peu développés et vides; leur contenu est passé dans les spores immobiles. Probablement nous avons affaire ici à un processus sexuel. Pour résoudre cette question, il faut encore des recherches ultérieures."

IV. ASCOMYCETAE.

[Ascomycetæ]

ACKERMANNIA Patouillard n. g. Gymnoascaceæ. Bulletin de la Société Mycologique de France, 18:180. 15 Mai 1902.

"Strome superficiel, en forme de croûte ou de coussinet, peu dense, laineux, de couleur claire, composé de filaments larges, rameux et distants.

"Périthèces complètement entourés par la trame stromatique, astomes, les uns des autres, constitués par des hyphes simplement rapprochées, peu serrées, rameuses, entourant les asques.

"Thèques colorées, volumineuses, ovoïdes, stipitées, naissant sur les branches des hyphes centrales des périthèces, et se disposant en une seule zone radiale.

"Spores?"

"La présence d'un strome entourant les organes ascophores caractérise ce genre, qui se rattache aux Gymnoascés par ses périthèces filamenteux. Il est voisin d'*Onygena* et touche de très près à *Endogone* dont il représente peut-être l'état parfait."

[Ascomycetæ]

ALLESCHERINA Berlese n. g. Sphæriaceæ. Malpighia, 16:300. 1902.

"*Allescherina* Berlese, in litteris.

"Stroma plerumque tenue, cortici adnatum, crustaceum, peridermio tectum, rarius ligno serpens; perithecia sparsa, paulo prominentia, globosa, cortici vel ligno immersa, erecta, in collum incrassatum repente producta; ostiola tumescentia, rotundata, plerumque integra, tandem late pertusa. Asci clavati, longe stipitati, polyspori; sporidia allantoides, pallide viridilutescentia.

"Ab affini genere *Cryptovalsa* Ces. et De Not. (em.) differt præcipue peritheciis sparsis vel subgregaris, sed nunquam in acervulos valsæformes bene definitos collectis."

[Ascomycetæ]

ARACHYNOMYCES Massee et Salmon n. g. Perisporiaceæ. Annals of Botany, 16:68. March 1902.

"Perithecia globosa simplicia astoma membranacea parenchymatica appendicibus fuscis eumorphis instructa, ascis minutis numerosis globosis, sporis primum conglobatis continuis fuscis.

"A *Pleuroasco*, Mass. et Salm., differt subiculi defectione et appendicibus fuscis, a *Magnusia*, Sacc., ascis globosis et sporis conglobatis."

[Ascomycetæ]

ARENAEA Penzig et Saccardo n. g. Pezizaceæ. Malpighia, 15:211. 1902.

"Ascomata minute stipitata, sursum in lobos varios (3-6) poculiformes divisa, ceraceo-membranacea, atra, setosa, contextu excipuli prosenchymatico. Asci elongati, paraphysati, octospori. Sporidia fusoides oblonga, continua, hyalina. Genus pulchellum, ascomate lobato-fisso, v. si mavis, pluri-cupulato insigne. Diceretur *Pirottaea* multiplex."

[Ascomycetæ]

ASCHERSONIOPSIS P. Hennings n. g. Hypocreaceæ. Hedwigia, 41:7. 5 Mar. 1902.

"Stromata cornea, dura, subglobosa, extus atra, intus pallida. perithecia prima subimmersa, globulosa dein erumpenti-superficialia, discoidea, pallida; hypha conidiophora hyalina, filiformes. Conidia subglobosa, hyalina.

"A. globosa P. Henn. n. sp. . . . Dieses Conidienstadium gehört höchst wahrscheinlich zu einer Hypocrella. Von Ascher-sonia ist dasselbe gänzlich verschieden."

[Ascomycetæ]

ASCOPOLYPORUS A. Möller n. g. Hypocreaceæ. Phycomyceten und Ascomyceten, 300. 1901.

“Stroma knollig oder hufförmig, fleischig oder gallartig, mit steriler Ober- und fertiler Unterseite. Fadensporige Schläuche. Conidien in Ketten oder verklebten Köpfchen?”

[Ascomycetæ]

BAUMIELLA P. Hennings n. g. Amphisphæriaceæ. Baum's Kumene-Sambesi Expedition, 165. 1903.

“Perithecia cæspitosa erumpentia dein superficialia, membranacea, sublævia vel regulosa, minute ostiolata dein collabentia; asci clavati octospori; sporæ oblongæ, hyalinæ, subflavidulæ, dein 3-septatæ.

Von Trematostoma Sacc. durch die häutigen Perithechien, ebenso von Winteria Rehm, sowie von Bertia durch das Vorkommen verschieden.”

[Ascomycetæ]

BIATORELLINA P. Hennings n. g. Patellariaceæ. Beiblatt zur Hedwigia, 42:(307). Dec. 1903.

“Ascomata superficialia sessilia vel stipitata, obconicopatellata, submarginata, cornea, dura, atra, disco plano. Asci clavati, polyspori, paraphysati. Sporæ bacillarizæ, hyalinæ, continuæ. . . . Biatorellæ et Comesizæ affin.”

[Ascomycetæ]

BLASDALEA Sacc. et Syd. n. g. Microthyriaceæ. Sylloge Fungorum, 16:634. 1 Feb. 1902.

“Perithecia sessilia, mycelio hyalino insidentia, dimidiata, orbicularia, disciformia, atra, centro demum subpapillata et poro minuto pertusa, membranacea. Asci oblongo-clavati octospori, paraphysati. Sporidia globosa, continua, colorata. — A *Vizella* differt peritheciis mycelio insidentibus sporidiisque globosis.”

[Ascomycetæ]

BRESADOLELLA v. Höhnelt n. g. Nectriaceæ. Annales Mycologici, 1:522. 10 Dec. 1903.

“Peritheciis superficialibus, sessilibus, liberis, globosis, carnosus, ex aureo olivascentibus, pilis rigidis ornatis, ostiolo minuto; paraphysibus parvis; ascis clavatis, octosporis; sporidiis hyalinis, e cellulis binis, oblongis, facile jamque ipso in asco se separantibus formatis.

“Bresadolella aurea n. sp. I. Fungus ascophorus. . . . II. Fungus conidiophorus (*Dendryphium Bresadolellae* n. sp.)

“Die Gattung *Bresadolella* steht der Gattung *Neorehmia* äusserst nahe, und war ich ursprünglich geneigt, den Pilz zu letzterer Gattung zu stellen. Da aber *Neorehmia* in der Regel kein deutliches Ostiolum besitzt und daher als Perisporiaceæ zu betrachten ist, während *Bresadolella* stets eine Perithechienöffnung zeigt, an der ich auch das Austreten der Sporenhälften beobach-

ten konnte, auch das Gehäuse des neuen Pilzes weich, Nectriaceen-artig ist, und sich die beiden Gattungen schon habituell durch die verschiedene Behaarung auffallend unterscheiden, schloss ich mich der Ansicht des Herrn Dr. Rehm an, dass die Aufstellung eines neuen Genus unbedingt gerechtfertigt ist.

Durch die schon im Schlauche in 2 Hälften zerfallenden Sporen erinnert *Bresadolella* an *Hypocrea*, die aber in ein Stroma eingesenkte Perithechien besitzt. Unter den Nectriaceen scheint am nächsten *Lasionectria* (Subgenus von *Nectria*) verwandt, hier zerfallen aber die Sporen nicht in ihre Hälften und die Behaarung ist hellfarbig. Unter den Sphæriaceen erscheint am nächsten verwandt die Gattung *Eriosphaeria*.

“Der als Conidienpilz beschriebene Hyphomycet gehört ohne Zweifel in den Entwicklungskreis der *Bresadolella*, die sich stets nur in den Rasen desselben vorfand, und daher auch mit der Lupe nicht zu sehen war. Derselbe ist kein typisches *Dendryphium* und könnte auch als *Helminthosporium* aufgefasst werden.”

[Ascomycetæ]

BULGARIOPSIS P. Hennings n. g. Bulgariaceæ. Hedwigia, 41:21. 5 Mar. 1902.

“Ascomata gelatinosa, primo clausa clavata, stipitata vel sessilia, dein disciformia, intus glutinosa, subelastica. Asci clavati, paraphysati, 8-spori. Sporæ bacillares, continuæ hyalinæ. Genus inter Ombrophilam, Bulgariam Cordieritemque.”

[Ascomycetæ]

CALOSTILBE Sacc. et Syd. n. g. Hypocreaceæ. Sylloge Fungorum, 16:591. 1 Feb. 1902.

“A *Sphaerostilbe* differt præcique sporidiis coloratis et status conidici arthrosporioidei characteribus.”

[Ascomycetæ]

CAPNODIOPSIS P. Hennings n. g. Capnodiaceæ. Hedwigia, 41:298. 15 Dec. 1902.

“Mycelium fuscum, sparsum. Perithecia subcoriacea, varie globulosa, vertice elongato cornuta, atra, apice rotundato aperta. Asci ovoidei vel subglobosi, tunicati, 8-spori. Sporæ subglobosæ, continuæ, hyalinæ vel dilute fusciculæ.”

[Ascomycetæ]

CERION Massee n. g. Stictææ. Royal Botanic Gardens, Kew, Bulletin of Miscellaneous Information. Nos. 175-177, p. 159. July-September, 1901.

“*Ascophora* erumpentia, cerata, marginata, sessilia, hymenio plano læte colorato. Asci cylindrici, octospori. Sporæ filiformes, hyalinæ, multiseptatæ. Paraphyses filiformes.

“Allied to the genus *Schizoxylon*, distinguished by the prominent free entire margin and the brightly coloured disc. The spores break up into segments through the septa when mature. Entire substance of the fungus waxy.”

[Ascomycetæ]

CHORIOACTIS Kupfer n. g. Pezizaceæ. Bulletin of the Torrey Botanical Club, 29:142. March 1902.

"Chorioactis Geaster. (*Urnula Geaster* Peck, Reg. Rep. 46:39. 1903.) Finally we come to the species which was called by Peck *Urnula Geaster*, and which, since it is not an *Urnula*, I propose to call *Chorioactis*. This is a very large leathery fungus from 4-7 cm. in diameter, narrowed to a stem about 3 cm. long and 1-1.5 thick. The apothecium splits into 4-6 rays, giving the plant an appearance very similar to a *Geaster*, so that Peck's specific name is an appropriate one. Both disc and stem are covered on the outside with a dense tomentum of soft brown hairs. The thickness of the apothecium is a striking characteristic; it sometimes reaches 2.5 m. The outer layer of the apothecium is dark brown, the hymenium and flesh yellowish white; the asci are very large, 670 μ long; the spores are 49-60 μ long by 12-16 μ wide. The *Geaster*-like appearance of this fungus, the tough, leathery texture, the thickness of the disc, and the velvety tomentum which clothes the whole surface make of it an exceptionally characteristic and easily distinguishable genus and species. That it is not an *Urnula* seems to me just as evident from its external appearance as from examination of its tissues. A comparison of internal characters shows, however, that there is no possible relation with *Urnula Craterium*. The tissue is made up wholly of large parenchymatous cells; those of the excipulum averaging 34 μ in diameter, those of the hypothecium 10-14 μ . The relative size of the cross sections of the various forms discussed can be seen from the fact that the sections of *Chorioactis Geaster* are magnified only thirty-five times, while all the others were magnified about two hundred times."

[Ascomycetæ.]

CILIELLA Sacc. et Syd. n. g. Pezizaceæ. Sylloge Fungorum, 16:748. 1 Feb. 1902.

"Ascomata sessilia, orbicularia, subgelatinosa, disco subplano, immarginato, excipulo parenchymatico. Asci ovati, octospori. Sporidia fusiformia, pluriseptata, hyalina, utroque apice 1-ciliata. Paraphyses conglomeratae, epithecium formantes. Jodi ops nulla."

[Ascomycetæ.]

COUTINIA d'Almeida et de Souza da Camara n. g. Sphaeriaceæ. Revista Agronomica, 1:392. Dec. 1903.

"*Perithecia carbonacea, plerumque conglomerata, haud stromatica, oestiole pertuso, subtectae; asci octospori, stipitati, paraphysati; sporidia continua, hyalina, plus minus elliptica, districha.*"

"A familia *Dothideacearum* praecipue different stromate nullo."

[Ascomycetæ.]

CRIELLA Saccardo n. n. [ut subg. *Rhytisma*.] Sylloge Fungorum, 16:786. 1 Feb. 1902.

"Sporidia ovoidea, brunnea."

[Ascomycetæ.]

DAVINCELLA (as sub-genus), *see Davincia*.

[Ascomycetæ.]

DAVINCIA Penzig et Saccardo n. g. Pezizaceae. Malpighia, 15:215. 1902.

"Ascomata ceraceo-membranacea, stipitata, v. sessilia (*Davincia*), læticoloria, margine eximie dentato-fimbriata. Asci paraphysati, octo-spori. Sporidia oblonga, 2-pluriseptata, hyalina. Contextus totius fungilli anguste prosenchymaticus, tenacellus. Est *Cyathicula* hyalophragma, et inter Pezizaceas occupabit n. 189. Cfr. Sacc. Tabul. compr. pag. 31."

[Ascomycetæ.]

DELPONTIA Penzig et Saccardo n. g. Stictidaceae. Malpighia, 15:220. 1902.

"Ascomata jugiter immersa, immarginata, disciformia, ceracea læticoloria (omino ut in *Stictide*). Asci elongati paraphysati octospori. Sporidia oblonga, 3-pluriseptato-muriformia, hyalina. — Nonnullis generibus affinis, differt tamen a *Melittosporio* ascomate stictoideo, nec hysteroideo, a *Pleiostrictide* et *Platysticta* ascomate discoideo, læticolori, ascis octosporis, sporidiis minutis etc. Est genus *Stistidi* prorsus parallelum."

[Ascomycetæ.]

DIAGMASCELLA Maire et Saccardo n. g. Phacidiaceae. Bulletin Société botanique de France, 48:ccv. Sept. 1903.

"Apothecia foliicola, diu epidermide tecta, excipulo omnino carentia, paraphysibus filiformibus; asci tetrasporis; ascosporis phaeodidymus, inequaliter septo divisis, muco obvolutis.—A Didymasco ascosporis phaeodidymis, nec non habitu apothecii paraphysiumque recedit, et certe ad Phacidiaceas accedit."

[Ascomycetæ.]

DIAGYRIUM Sacc. et Syd. n. sub-genus. Agyrium. Sylloge Fungorum, 16:769. 1 Feb. 1902.

"Sporidia 1-septata."

[Ascomycetæ.]

DIDYMASCELLA Maire et Saccardo n. g. Phacidiaceae. Bulletin Société botanique de France, 48:ccv. Sept. 1903.

"Apothecia foliicola, diu epidermide tecta, excipulo omnino carentia, paraphysibus filiformibus; ascis tetrasporis; ascosporis phaeodidymus, inequaliter septo divisis, muco obvolutis.—A Didymasco ascosporis phaeodidymis, nec non habitu apothecii paraphysiumque recedit, et certe and Phacidiaceas accedit."

[Ascomycetæ.]

DIELSIELLA P. Hennings n. g. Hysteriaceae. Beiblatt zur Hedwigia, 42:(84). März. 1902.

"Perithecia erumpenti-superficialia carbonaceo-atra, convexo-pulvinata vel scutellata, medio depressa papillata, rima subcirculari dehiscentia. Asci ovoidei vel clavati, 4-8-spori, copiose para-

physati. Sporae ellipsoideae, 1-septatae, atro-fuscae. Tryblidio Lembosiae, Schizocycloni affin.”

[Ascomycetæ.]

DISCOMYCOPSELLA P. Hennings n. g. Leptostromataceae. Hedwigia, 41:146. 5 Aug. 1902.

“Perithecia innato-erumpentia, carbonacea, atra vertice porosorimosa. Conidia conglobata subglobosa vel ovoidea, fusco-brunnea, granulato-verrucosa. Discomycopsi aff.”

[Ascomycetæ.]

EIDAMELLA Matru. et Dassonv. n. g. Gymnoascaceae. Bulletin de la Société Mycologique de France, 17:129. 13 May 1901.

“Périthèces buissonneux; péridium formé d’hyphes à paroi épaisse, cutinisée et noire, abandonnement ramifiés, portant de courtes branches latérales à pointe incolore sur laquelle s’insère, dans le jeune âge, un à cinq filaments spirales incolores. Asques nombreux, ovales, courtement pédicelles, renfermant huit ascospores fusiformes, incolores.”

[Ascomycetæ.]

ENTONAEMA A. Möller n. g. Sphæriaceæ (Xylariacæ). Phycomyceten und Ascomyceten, 306. 1901.

“Fruchkörper hohl, weichfleischig, innen gallertig, unregelmässig geformte, oft mehrere cm. grosse Knollen oder Blasen mit verhältnissmässig dünner Wandung darstellend. Perithecien auf der ganzen Oberfläche eingesenkt. Schlauchsporen einzellig, dunkel.”

[Ascomycetæ.]

EOTERFEZIA Atks. n. g. Elaphomycetes. Botanical Gazette, 34:40. July 1902.

“Fruit bodies subglobose, minute, fleshy, with a distinct but very thin, undifferentiated wall, smooth or slightly hairy. Interior of fruit body with sterile avenues radiating from the base and branching until they unite with the wall. Fertile areas lying between containing the asci intermingled with the supporting hyphae. Spores smooth, hyaline, one-celled. Interior not disintegrating into a powdery mass at maturity. At present one species.”

[Ascomycetæ.]

EOTERFEZIACEÆ Atks. n. fam. Elaphomycetes. Botanical Gazette, 34:40. July 1902.

“Fruit bodies with a thin but distinct wall of closely interlaced hyphae. Interior with sterile avenues connected with the wall and separating the fertile areas where the asci are irregularly arranged.”

[Ascomycetæ.]

FLAMINIA Sacc. et Syd. n. g. Stictidaceae. Sylloge Fungorum 16:777. 1 Feb. 1902.

“Ascomata primitus innata, globosa, clausa, dein disco punctoideo-aperto, orbiculari, demum plano. Asci ovoidei, polyspori, parce paraphysati. Sporidia globosa, hyalina, levia. — *Lindauellae* affinis, sed plane differt ascis ovatis polysporis.”

[Ascomycetæ.]

FLEISCHERIA Penzig et Saccardo n. g. Hypocreaceae. *Malpighia*, 15:230. 1902.

"Stroma tuberoso-sphæroideum, biogenum, majusculum, basi applanata sessile, mox sclerotiaceo-corneum, durum. Perithecia omnino immersa, globoso-piriformia, ostiolo papillato vix emergente. Asci tereti-elongati, aparaphysati. Sporidia polysticha, filiformia, hyalina, mox in articulos bacillares utrinque obtusos dilabentia. — Genus insigne, ab *Hypocrella*, *Moelleriella* et *Ascopolyporo* stromate mox indurato, sclerotiaceo-corneo distinguendum."

[Ascomycetæ.]

GLOEOCALYX Massee n. g. Bulgariæ. Royal Botanic Gardens, Kew, Bulletin of Miscellaneous Information, Nos. 175-177, p. 155. July-September, 1901.

"*Ascomata* subgelatinosa, sessilia, cupulata, extus reticulata, glaberrima. *Asci* cylindranei, apice truncati, octospori. *Sporae* 1-seriatæ, hyalinæ, ellipticæ, aseptatæ. *Paraphyses* filiformes.

"Allied to *Bulgariella*, Sacc., from which the present genus differs in having hyaline spores."

[Ascomycetæ.]

GLOMERELLA v. Schrenk & Spaulding n. n. (*Gnomoniopsis* Stoneman.) [Type, *Septoria rufomaculans* (Berk.) 1854.] *Science*, N. S. 17:750-1. 8 May 1903.

[Ascomycetæ.]

GRAPHYLLIUM Clements n. g. Hypodermiaceae. Botanical Survey of Nebraska, 5:6. 30 March 1901.

"*Hysterothecium* innate, then erumpent, linear, simple, membranaceous-plectenchymatous, black; asci ovoid or cylindrical-clavate, 8-spored; spores brown, elliptical to oblong, with transverse and longitudinal septa, but not muriform; paraphyses simple or branched, septate, forming an epithecium."

[Ascomycetæ.]

GUIGNARDIELLA Sacc. et Syd. n. n. [*Vestergrenia* Rehm 1901, nec Sacc. et Syd. subg. 1899.] *Sylloge Fungorum*, 16:465. 1 Feb. 1902.

[Ascomycetæ.]

HASSEA Zahlbruckner n. g. Pyrenidiaceae (Lichenum). *Beihfte zum Botanischen Centralblatt*, 13:150. 1902.

"Thallus crustaceus, uniformis, hyphis medullaribus substrata affixus, rhizinis destitutus, homœomericus, ecorticatus, gonidiis nostocaceis, glomerulosis. Apothecia pyrenocarpica, simplicia, gonidiis hymenialibus nullis, perithecio recto, fulgineo. Paraphyses laxè ramoso-connexæ, parum conspicuæ. Asci 8 spori. *Sporae* bacillares, simplices et hyalinæ. Pycnoconidia ignota."

[Ascomycetæ.]

HENNINGSINIA A. Möller n. g. Sphæriaceæ. Phycomyceten und Ascomyceten, 309. 1901.

"Stromata mit einer urnenartigen Vertiefung, in welcher die lang cylindrischen Perithechien dicht gedrängt stehen. Ueber ihnen liegt eine nicht durchbohrte feste Deckelscheibe, nach deren Verwitterung erst die Sporen frei werden können. Sporen einzellig, dunkel."

[Ascomycetæ.]

HETEROPHLEGMA Clements n. g. Pezizaceæ. Bulletin of the Torrey Botanical Club, 30:92. Feb. 1903.

"Apothecia superficialia, sessilia, carnosia, hemisphæri-cupulata, fufuraceo-excipulata, magna; epithecium nullum; paraphyses præsentia; hypothecium percrassum, hyalinum, trilaminatum, lamina superiore et inferiore pseudoparenchymaticis, medullari hyphis parallelis intertextisque, tramitiforme; excipulum tenue, filis brevibus tomentosum. Asci octospori, cylindricei, iodo valde cærulescentes. Sporæ continuæ, hyalinæ, ellipticæ. Nomen propter hypothecium laminatum, herteos, dissimilis, plegma, vimineum.

"Est *Plicaria* hypothecio heteromorpha."

[Ascomycetæ.]

HYPODERMOPSIS Earle n. g. Hypodermataceæ. Bulletin of the New York Botanical Garden, 2:(345). 25 April 1902.

"Ascoma elongate, black, minute, confluent with the host tissues (as in *Hypoderma*); ascospores elliptic or spindle-shaped, brown, two or more septate.

"This is not to be confounded with *Rhytidhysterium*, although the spore characters are the same. In the latter genus the ascoma is fully erumpent with inrolled lips that expand to discoid when moistened. It should probably be placed in the Cenangiaceæ rather than in the Hypodermataceæ. This family when properly defined forms a natural group in which the elongated ascoma is buried, having its walls more or less completely blended with the host tissue. The structure is comparable to that of *Rhytisma* in the Phacidiaceæ or of *Phyllachora* in the Dothi-deales."

[Ascomycetæ.]

HYPOSCYPHA Bres. n. g. Helotiaceæ. Broteria, Revista de Sci. Nat. Collegio S. Fiel, 2:89. 1903.

"Ascomata ceraceo-carnosula, stipitata, ex urceolato scutellata, textura prosenchymatica, sc. e cellulis cylindaceis, elongatis, extus ex hyphis terminalibus, contextis, prolongato-disjunctis villosa, Asci tereti-fusoidei, 8-spori. Sporæ hyaline, oblongæ vel fusoidæ. Paraphyses filiformes, apice obtusæ plus minusve vel vix incrassatæ.

"A genere *Dasyscypha* differt deficientia pili genuini in ascomate."

[Ascomycetæ.]

LINHARTIA Sacc. et. Syd. n. g. Pezizaceæ. Sylloge Fungorum, 16:744. 1 Feb. 1902.

"Ascomata in mycelio vel bysso tenui sessilia, primitus, globoso-clausa, dein patellaria, disco plano vel convexulo, glabra. Asci clavati, paraphysati, octospori. Sporidia hyalina, 1-septata, ovata.—Est quasi *Trichobelonium* hyalodidymum."

[Ascomycetæ.]

LIZONIELLA P. Henn. n. subg. Lizonia. Beiblatt zur Hedwigia, 40:(96). Juli, Aug. 1901 (15 Aug. 1901.)

"Die Sporen sind stets hyalin und dadurch besonders von den braunsporigen Arten der Gattung Lizonia Ces. et DeNot. verschieden."

[Ascomycetæ]

MESNIERA Sacc. et Syd. n. g. Sphæriaceæ. Sylloge Fungorum, 16:440. 1 Feb. 1902.

"Perithecia minuta, globosa, rufo-brunnea. Asci fasciculati, cylindracei, paraphysati, 12-16-spori. Sporidia continua, colorata, globosa vel ovato-globosa, verrucosa.—*Anthostomellae* affinis, differt ascis polysporis sporidiisque verrucosis."

[Ascomycetæ]

MIDOTIOPSIS P. Hennings n. g. Dermateaceæ. Hedwigia, 41:17. 5 Mar. 1902.

"Ascomata erumpenti-superficialia, coriacea plus minus stipitata, primo clausa dein subcupulata extus tomentosula. Asci cylindraceo-clavati, 8-spori, paraphysati. Sporæ globosæ, hyalinæ, continuæ."

[Ascomycetæ]

MOELLEROC LAVUS P. Hennings n. g. Xylariaceæ. Hedwigia, 41:15. 5 Mar. 1902.

"Stroma conidiophorum subcarnosum, elongato-fusiforme, lateraliter, ramosum, ramuli breves apice capitati, capitulum ex hyphis radiantibus fuscidulis compositum. Conidia acrogena ellipsoidea, fuliginea, continua. Stroma ascophorum subcarnosum, atro-corticatum, subclavatum. Perithecia immersa, subglobosa, immatura.

"M. Penicilliopsis P. Henn. n. sp. A. Möll. Phyc. u. Ascom. p. 244. c. fig.

"Die Askenstromata sind von denen einer Xylaria aus der Sect. Xyloglossa kaum verschieden und dürfte die Gattung zweifellos mit Xylaria nahe verwandt, vielleicht die Art gar beschrieben worden sein, was aber vorläufig nicht feststellbar ist."

[Ascomycetæ]

MOELLERODISCUS P. Hennings n. g. Cudoniaceæ. Hedwigia, 41:33. 5 Mar. 1902.

"Ascomata membranaceo-carnosa, subgelatinosa, convexa, longe stipitata, disco levi, margine revoluto. Asci clavati 8-spori,

paraphysati. Sporæ subfusoideæ, hyalinæ, continuæ. *Cudonielliae affinis.*"

[Ascomycetæ]

MORENULA Sacc. et Syd. n. subg. Morenœlla. Sylloge Fungorum, 16:655. 1 Feb. 1902.

"Perithecia molliuscula, subicula carentia paraphysibus instructa."

[Ascomycetæ]

MOUTONIELLA Penzig et Saccardo n. g. Phacidiaceæ. Malpighia, 15:221. 1902.

"Ascomata immersa, disciformia, subceracea, operculo epidermoideo nigricante, facile secedente tecta. Asci elongati, paraphysati (semper?), octospori. Sporidia filiformia, ascum subæquantia, hyalina. Est omnino *Stegia* scolecospora, n. 36 inter Phacidiaceas occupans. Cf. Sacc. *Tab. comp.* p. 33."

[Ascomycetæ]

MYCOCITRUS A. Möller n. g. Hypocreaceæ. Phycomyceten und Ascomyceten, 297. 1901.

"Fruchtkörper festfleischig knollig, ringsum mit halbeingesenkten bis ganz freien Peritheciën besetzt. Peritheciën bisweilen nach Ueberwachsen der älteren in mehrfacher Schicht übereinander. Sporen zweizellig."

[Ascomycetæ]

MYCOMALUS A. Möller n. g. Hypocreaceæ. Phycomyceten und Ascomyceten, 300. 1901.

"Stroma kuglig, knollig, fleischig, mit einer gürtelartig angeordneten scharf begrenzten fertilen Zone, und zwei sterilen Endflächen; die fadenförmigen Sporen zerfallen sehr früh in unzählbare Theilsporen."

[Ascomycetæ]

MYCOSPHERIUM (Johan.) Clements n. n. (Mycosphærella Johan.) Bulletin of the Torrey Botanical Club, 30:84. Feb. 1903.

"Pro Mycosphærella Johan., nomine hybrido."

[Ascomycetæ]

MYRIANGIELLA Zimmermann n. g. Myriangiæ. Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, Zweite Abteilung, 8:183. 10 Feb. 1902.

"Stroma sehr flach scheibenförmig, in dem ganzen centralen Teile in einer Schicht Asci bildend. Asci 8-sporig. Sporen länglich, nur quergeteilt, hyalin."

[Ascomycetæ]

OHLERIELLA Earle n. g. Amphisphæriaceæ. Bulletin of the New York Botanical Garden, 2:(349). 25 April 1902.

"Perithecia as in *Amphisphaeria*, asci large, at first 8-spored, the young spores hyaline and several-celled, at maturity brown

and separating within the ascus at all the septa, the ascus thus becoming many-spored and the spores unicellular.

"This is clearly related to *Ohleria* in which the 4-celled spore divides into two 2-celled parts at maturity, the ascus thus becoming 16-spored, or it may be compared to a *Trematosphaeria* in which the spores fall to pieces in the ascus before maturity."

[Ascomycetæ]

OPHIODICTYON Sacc. et Syd. n. g. Sphæriaceæ. Sylloge Fungorum, 16:555. 1 Feb. 1902.

"Perithecia superficialia, turbinata vel fere clavulato-cylindrica, centraliter papillulata, circa papillulam discum nudum præstantia, ad marginem pilis fasciculatis coronata, carneo-coriacea. Asci clavati, octospori, paraphysati. Sporidia anguste fusoides v. subfiliformia, transverse multiseptata, muriformia, hyalina. — *Actiniopsidi* Starb. inter hyalophragmias affine."

[Ascomycetæ.]

OPHIOGLOEA Clements n. g. Bulgariæ. Bulletin of the Torrey Botanical Club, 30:86. Feb. 1903.

"Apothecia superficialia, sessilia, gelatinosa, olliiformia, extus atro-excipulata, hymenio læticolore; epithecium nullum; hypothecium plectenchymaticum, crassum, hyalinum, iodo cærulescens; excipulum parenchymaticum ad basin præcipue crassum, atro-avellaneum. Asci octospori, lineares, perlongi. Paraphyses simplices, longe clavulatæ, fere hyaline. Sporæ filiformes, parallele congestæ, ætate septulatæ, hyalinæ. Nomen propter formam sporarum textumque apothecii, *ophis*, anguis, *gloia*, gluten.

"A *Holwaya* differt forma cupulæ excipuloque, ab *Agyriopsiside* excipulo, a *Bactrospora*, *Lahmia* et *Mycobacidia* contextu epithecioque, a *Gorgonicipe* excipulo parenchymatico."

[Ascomycetæ.]

PARODINA Sacc. et Syd. [sub Parodiella aceris Rac. — "Ubi in hac specie et præcedente sporidia sint constanter hyalina, novum genus (*Parodina* Sacc. et Syd.) erit instituendum"]. Sylloge Fungorum, 16:412. 1 Feb. 1902.

[Ascomycetæ.]

PELODISCUS Clements n. g. Pezizaceæ. Botanical Survey of Nebraska, 5:7. 30 March 1901.

"Ascoma minute, superficial, sessile, carnose, cupulate, at length disciform or explanate, pilose without, but not ciliate at the margin; asci cylindrical, 4-8-spored, paraphysate; spores ellipsoid or oblong, hyaline.

"Pelodiscus agrees with *Humaria* and *Scutellinia* in having the ascoma superficial, while in *Sepultaria* and in *Sarcosphaera* it is at first hypogæous. It agrees with *Sepultaria* in being simply tomentose or lanose without, in which it differs from the smooth *Humaria* and the ciliate-tomentose *Scutellinia*."

[Ascomycetæ.]

PELORONECTRIA A. Möller n. g. Hypocreaceæ. Phycomyceten und Ascomyceten, 297. 1901.

"Parallelgattung zu Mycocitrus unter den phragmosporischen Hypocreaceen. Grosses knolliges Stroma, das ringsum mit Peritheciën besetzt ist."

[Ascomycetæ.]

PELTIGEROMYCES A. Möller n. g. Pezizaceæ. Phycomyceten und Ascomyceten, 310. 1901.

"Apothecien knorpelig, dünn, mit grosser mannigfaltig gelappter ausgebreiteter Scheibe. Sporen hyalin einzellig."

PERROTIA Boudier n. g. Discomycètes operculés. Bulletin de la Société Mycologique de France, 17:24. 20 Mar. 1901.

"Species minores, sessiles, pilosæ, primo clausæ, dien aut jove pluvio apertæ. Receptaculum sessile, carnosum, extus pilis septatis, coloratis, granulosi vestitum; hymenio thecis clavatis, octosporis, operculatis, ad apicem obtusis, ad basim attenuatis; paraphysibus filiformibus, septatis, intus parcè granulosi, ad apicem vix crassioribus, non acuminatis; sporis achrois, oblongis, hyalinis, rectis aut leniter curvulis, primo continuis, denique medio uni-septatis."

[Ascomycetæ.]

PHLEBOSCYPHUS Clements n. n. (pro Paxina). Bulletin of the Torrey Botanical Club, 30:93. Feb. 1903.

"*Acetabula* Fr. 1823, Fckl. 1869, propter *Acatabulum* L. 1735 concidit. *Phleboscypus* (*phelps*, *phlebos*, vena, *skuphos*, calix, propter venas apothecii) pro *Paxina* O. K., nomine *hybrido*, præpositum est."

[Ascomycetæ.]

PHYCOASCUS A. Möller n. g. Pezizaceæ. Phycomyceten und Ascomyceten, 309. 1901.

"Hypothallus weit ausgebreitet, aus locker verflochtenen sehr dicken Fäden. Apothecien verstreut auf dem Hypothallus, der in das Hypothecium ohne Grenze übergeht, umberandet, weich. Sporen hyalin einzellig. *Pyronema* verwandt?"

[Ascomycetæ.]

PLEURASCUS Mass. et Salm. n. g. Perisporiaceæ. Annals of Botany, 15:330. June 1901.

"Perithecia subiculo intertexto pannoso distincto vel confluyente insidentia, atra, astoma, membranaceo-carbonacea, fragilia, contextu parenchymatico, appendicibus pruribus hyalinis arcte spiraliter convolutis instructa; ascis globosis minutis numerosissimis mox diffluentibus in hyphis ramosis pleurogenis; sporis minutis fuligineis globosis.

"The present genus appears to be distinct among the *Phæosporæ* of the Perisporiaceæ in the dense pannose subiculum and the minute globose laterally-borne asci. The asci are pro-

duced in great numbers, and arise in a glomerulate manner on the delicate branched hyphae which fill the perithecium. This latter character suggests affinity with *Cephalotheca*."

[Ascomycetæ.]

POLYAGYRIUM Sacc. et Syd. n. sub-gen. Agyrium. Sylloge Fungorum, 16:769. 1 Feb. 1902.

"Sporidia 2-septata."

[Ascomycetæ.]

PSEUDOHEPPIA Zahlbruckner n. g. Ascolichenes. Annales Mycologici, 1:356. 10 Aug. 1903.

"Thallus squamosus, rhizinis destitutus, hyphis medullaribus substrato affluxus, homœomericus, non gelatinosus, nec corticatus, nec pseudo-parenchymaticus, hyphis thalli dense contextis, gonidiis scytonemeis, cellulis cœruleo-virescentibus, glomeruloso-concatenatis. Apothecia thallo innata, immersa permanentia, parithecio proprio indistincto, hypothallo pallido; sporæ 8-næ, simplices decoloresque. Pycnoconidia ignota.

"A genere *Heppia* differt thallo nullo loco pseudoparenchymatico."

[Ascomycetæ.]

PSILOTHECIUM Clements n. g. Patellariæ. Bulletin of the Torrey Botanical Club, 30:85. Feb. 1903.

"Apothecia superficialia, sessilia, ceraceo-coriacea, cupulato-hemisphaerica, nuda, nigra, minuta; epithecium nullum vel obsolescens, paraphyses lineares, simplices, hyalinæ; hymenium læticolore; hypothecium plectenchymaticum, crassum, pallide fuscum; excipulum carbonaceum, crassum, glabrum vel tuberculatum, brunneo-nigrum, margine libero incurvo. Asci octospori, clavati, iodo non tincti. Sporæ continuæ, hyalinæ ellipticæ, leves. Nomen propter epithecium obsoletum, *psilos*, nudus, *thecheion*, hymenium. *Patinellæ* affinis, sed differt paraphysibus simplicibus, epithecio nullo hymenioque læticolore."

[Ascomycetæ.]

PSOROTHECIELLA Sacc. et Syd. n. g. Pezizaceæ. Sylloge Fungorum, 16:746. 1 Feb. 1902.

"Ascomata patellaria, in mycelio tenuissimo hyalino-sessilia, excipulo subhyalino gonidiis destituto prædita, ceracea. Asci oblongi, 1-spori. Sporidia magna, 2-septata, hyalina. Paraphyses ramosæ. *Psorotheciopsidi* Rehm valde affinis, sed differt sporidiis 2-septatis."

[Ascomycetæ.]

PUTTEMANSIA P. Hennings n. g. Pezizaceæ. Hedwigia, 41:112. 23 June 1902.

"Ascomata caespitose erumpentia, carnosae, subglobosae dein cupulata colorata, villo omino vestita; asci clavati, paraphysati, 8-spori; sporae fusoides, 3-septatae, basi rostratae, hyalinae subflavidulae."

[Ascomycetæ.]

PYRENIDIACEAE Zahlbruckner n. fam. Lichenum. Beihefte zum Botanischen Centralblatt, 13:151. 1902.

“Ihrer systematischen Stellung nach gehört das neue Genus [Hasea] in jene Familie der Reihe der pyrenocarpen *Lichenen*, deren Gattungen durch die *Nostocaceen* oder *Ssytonema-Gonidien* ihres Lagers, ferner durch die einfachen und geraden Apothecien charakterisiert sind. Diese Familie umfasst ausser der Gattung *Hasea* noch die Genera *Eolichen* Zuk. *Placothelium* Müll. Arg. mit unberindeten, und *Coriscium* Wainio und *Pyrenidium* Nyl. mit berindetem Lager. Diese Familie, für welche ich den Namen *Pyrenidiaceae* in Vorschlag bringe, ist demnach weiter gefasst als Nylander's Tribus der *Pyrenidei*, welche nur auf die berindete Gattung *Pyrenidium* begründet ist. Eine Gruppierung der berindeten und unberindeten Gattungen zu je einer Familie halte ich nicht für nötig. Ein solcher Vorgang ist gewiss berechtigt bei einer Reihe thallodisch höher entwickelter Flechten, hier erscheint er mir nicht angemessen und zwar hauptsächlich in Anbetracht der thallodischen Verhältnisse der *Collemaceen*. Bei diesen, welche ebenfalls *Nostocaceen* als Algencomponenten besitzen, wechselt die Berindung des Lagers ungemein und es ist schwer, die Gattungen nach diesem Merkmale auseinander zu halten. Das Gesagte beweist die von Nylander creirte Gattung *Collemodium* und Wainio's Sektion *Collemodiopsis* der Gattung *Collema*, welche direkte Unbergänge von *Collema* zur Gattung *Lepetogium* aufweisen. Das anatomische Merkmal der Berindung des Lagers, welches bei anderen Flechtengruppen sich nicht nur vorteilhaft zur Begrenzung der Gattungen, sondern auch zur Charakterisierung der Familien verwenden lässt und mit Recht dazu benutzt wird, versagt bei den *Collemaceen*. Aus diesem Grunde wollte ich auch die kleine, nur wenige Gattungen umschliessende Familie der *Pyrenidiaceen* nicht weiter zergliedern.”

[Ascomycetæ.]

REHMIOMYCES Sacc. et Syd. n. subg. Bertia. Sylloge Fungorum, 16:489. 1 Feb. 1902.

“Rehmiomyces Sacc. et Syd. Perithecia mollia.”

[Ascomycetæ.]

RINIA Penzig et Saccardo n. g. Sphaeriaceae. Malpighia, 15:224. 1902.

“Perithecia biophila, phyllogena, membranacea, nigricantia, fasciis mycelicis, innato-prominulis, repentibus, anastomatico-reticulatis semimmersa, globulosa, ostiolo albido, appdicibus verruciformibus, majusculis, nigris, carbonoreis stellatim cincto, Asci oblongo-fusoidei, paraphysati, octospori. Sporidia ellipsoidea, continua, hyalina. Genus ostiolo maximo stellato praedistinctum, qua nota faciem sumit *Delpinoellae*, etsi fabricâ omnino diversum et nulli nec affine nec parallelum.”

[Ascomycetæ.]

RUHLANDIELLA P. Hennings n. g. Rhizinaceae. Beiblatt zur Hedwigia, 42:(24). Jan.-Feb. 1903.

"Ascomata superficialia, globosa, laevia, glabra, intus gelatinoso-carnosa, pseudoparenchymatica, hyalina, basi myceliofera. Asci cylindraceo-clavati, octospori, paraphyasti. Sporae globosae, brunneae, reticulato-verrucosae."

[Ascomycetæ.]

SACCHAROMYCOPSIS Schiønning n. g. Saccharomycetes. Comptes-Rendus des Travaux du Laboratoire de Carlsberg, 62: 124. 1903.

"Levures bourgeonnantes et donnant des endospores. La spore est munie de deux membranes et germe par bourgeonnement."

[Ascomycetæ.]

SCYTOPEZIS Clements n. g. Dermateae. Bulletin of the Torrey Botanical Club, 30:87. Feb. 1903.

"Apothecia superficialia, sessilia, ceraceo-coriacea, hemisphaerico-cupulata, atra, pilosa, margine stellatim fisso; ephithecium nullum; paraphyses praesentes; excipulum crassum, nigro-brunneum, pseudoparenchymaticum, pilis longis, atris dense obsitum; hypothecium crassum hyalinum, prosenchymaticum. Asci octospori, cylindracei, inoperculati, iodo tincti. Sporae continuae, hyalinae, ellipticae, leves. Nomen propter texturam apothecii, *skutos*, *corium*, *pezis*, fungus sessilis."

"Est Urnula estipitata, excipulo parenchymatico."

[Ascomycetæ.]

SOLENOPLEA Starback n. g. Xylariaceae. Bihang till Kongl. Handlingar, Stockholm, 27⁹:13. 1901.

"Stroma marginatum, fere totum, peritheciis cylindricis, altissimis plenum. Asci numerosissimi, e parietibus perithecii ubique oriundi. Sporidia continua fuliginea."

[Ascomycetæ.]

SPHAERODOTHIS Saac. et Syd. n. subg. Auerswaldia. Sylloge Fungorum, 16:625. 1 Feb. 1902.

"Sporidia globosa."

[Ascomycetæ.]

SPHAEROSTILBE Tulasne emend. A. Möller. Xylariaceae. Phycomyceten und Ascomyceten, 296. 1901.

"Die Gattungsdiagnose auf Seite 99-100 Band III der Carpologie ist dahin zu erweitern, dass die Perthecien, welche dort als 'nuda' bezeichnet sind, auch fein behaart, und die Ascen, welche 'quasi sessiles' genannt sind, auch lang gestielt sein können. Endlich müsste man zu dem Charakter 'sporae pallide' noch 'aut olivascentes' hinzusetzen."

[Ascomycetæ.]

SPHAEROSTILBELLA P. Hennings n. subg. Sphaerostilbe. Engler's Botanische Jahrbücher, 30:41. 12 Mar. 1901.

"Es wurden nur unseptierte Sporen beobachtet und gründet sich hierauf das Sub-genus *Spaerostilbella*."

[Ascomycetæ.]

SPIROGRAPHA Zahlbruckner n. g. Ascholichenes. Die Natürlichen Pflanzenfamilien, Lichenes (Flechten) I. Teil, 1. Abt.:96. 1903.

"Lager wie bei *Opegrapha*, Apothezien wie bei *Opegrapha* sect. *Euopegrapha*, die Schläuche jedoch vielsporig und die Sporen farblos, 2 zellig, nadelförmig, spiralig in einander gewunden."

[Ascomycetæ.]

SPOROCTOMORPHA Almeida et S. Cam. n. g. Sphaeriaceae. Revista Argonomica, 1:90. March 1903.

"Uerithecia sparsa, simplicia, subsuperficialia, glabra; contextu molliusculo hyalino; sporidia muco destituta, hyalina, tri-septata, ad septum medianum valde constricta, subfusoida."

[Ascomycetæ.]

SPUMATORIA Mass. et Salm. n. g. Sphæriceæ. Annals of Botany, 15:350. June 1901.

"Perithecia subglobosa, semi-immersa, demum superficialia, membranacea, in rostrum longum cylindraceum apice fimbriatum plus minus dilatatum attenuata, ascis tenuibus, evanescentibus, octosporis, sporis, didymis, hyalinis, demum in spuma mucilaginosa ex ore rostri ejectis; paraphysibus indistinctis."

[Ascomycetæ.]

SQUAMOTUBERA P. Hennings n. g. Xylariaceæ. Beiblatt zur Hedwigia, 42:(308). Dec. 1903.

"Stromata subterranea?, tuberiformia, rotundata-depressa, intus subcarnosa pallida, extus membranas, subpapyraceas, squamosas vestita. Hyphæ fertiles, septatæ, ramosæ; conidia catenulata, subglobosa vel ovoidea, hyalina. Perithecia stromate atro ubique immersa, ostiolis subhemisphæricis, punctiformibus, atris. Asci octospori, cylindracei. Sporæ oblonge fusoidæ, fuscæ. Penzigia et Engleromycete affinis."

[Ascomycetæ.]

STARBÆCKIELLA Sacc. et Syd. n. subg. Clypeospæria. Sylloge Fungorum, 16:519. 1 Feb. 1902.

"Perithecia majuscula; sporidia muco tenui obvoluta."

[Ascomycetæ.]

STILBOHYPOXYLON P. Hennings n. g. Xylariaceæ. Hedwigia, 41:16. 5 Mar. 1902.

"Stroma subcarbonaceum, atrum, hypoxyloideum, subglobosum. Perithecia pauca, immersa, membranacea, pallida. Asci cylindracei immaturi. Stroma conidioferum liberum vel stromate ascofero insertum, subulatum apice mucoso-capitatum. Conidia acrogena, subglobosa, fuscidula."

[Ascomycetæ.]

TAPHRIDIUM Lagerheim et Juel n. g. Protomycetaceæ. Bulletin de la Société Mycologique de France, 17:271. 15 Dec. 1901.

"*Taphridium* Lagerheim et Juel est un genre nouveau que nous créons en lui attribuant deux espèces: *Taphrina umbelliferarum* Lagerheim et *Taphridium algeriense* Juel. Elles n'appartiennent pas à la famille des Exoascacées, mais à celle des Protomycétacées; elles sont, en effet, très voisines des *Protomyces* dont elles se distinguent pourtant par leur port qui est celui d'un *Exoascus*. Nous comptons publier à bref délai nos recherches sur le développement et la structure de ces espèces."

"*Taphridium* Lagerh. & Juel n. gen.

"Hyphæ fertiles sub epidermide foliorum superiore repentes, stratum sporangiorum demum fere continuum, *Taphrinæ* instar, formantes. Sporangia globosa vel breviter ellipsoidea, membrana plus minusve incrassata, non tamen indurata instructa, non hibernanti, sporas numerisissimas ovoideas satim ejicientia." Bihang till kongl. Svenska Vetenskaps-akademiens Handlingar, 27:Pt. 3, No. 16. p. 7. 1902.

[Ascomycetæ.]

TICHOSPORIUM (Sacc.) Clements n. n. ["est *Teichosporella* Sacc., sectio *Teichosporæ* (*Strickeriæ*)."] *Teichosporella* verbum hydridum est, itaque ad *Tichosporium* corrigenda. Bulletin of the Torrey Botanical Club, 30:83. Feb. 1903.

"*Perithecia* sparsa vel gregaria, superficialia vel basi immersa, sphæroidea vel ovata, ostiolo papillari vel inconspicuo, coriacea vel carbonacea, atra, glabra. Asci cylindranei vel clavati, typice 8-spori. Sporidia elliptica vel oblongata, murali-divisa, hyalina. Paraphyses graciles aut parum notabiles."

[Ascomycetæ.]

TRACHYXYLARIA A. Möller n. g. Sphæriaceæ. *Phycomyceten und Ascomyceten*, 308. 1901.

"Wie *Xylaria* aber mit zweizelligen Sporen."

[Ascomycetæ.]

TRIDENS Massee n. g. Phacidiaceæ. *Journal of the Linnean Society*, 35:113. 15 July 1901.

"*Ascomata* immersa, disciformia, immarginata, excipula atro epidermidi concreto et cum illo in lacinia acutas e centro fissa. Asci clavati, octospori; sporæ hyalinæ, oblongæ, muriformes; paraphyses filiformes, clavulatæ.

"Est *Phacidium dictyosporum*."

[Ascomycetæ.]

VESTERGRENIA H. Rehm n. g. Sphæriceæ. *Hedwigia*, 40:100. 20 April 1901.

"*Perithecia* sessilia, globosa, glabra, haud papillata, poro minutissimo pertusa, membranacea, atra, basi hyphis fuscis conjuncta. Asci ovaes, crasse tunicati, longe tenerime stipitati, 8-

spori. Sporidia elliptica, 1-cellularia, hyalina, 3-sticha. Paraphyses nullæ.

"(Von Coleroa durch 1 zellige Sporen und glattes Gehäuse, sowie durch ganz anders geformte Schläuche, von Trichosphæria durch häutige glatte Perithechien völlig verschieden. Wurde zu Ehren des trefflichen schwedischen Pilzforschers Vestergren benannt. Scortechinia Sacc. ist nahe verwandt, besitzt aber ein 'subiculum ubique spinulis acute dentatis exasperatum.' Pilgeriella Hennings [Hedwegia XXXIX. p. 137] hat krustiges Mycel, perithecia papillato-ostiolata, asci clavati.)" [Sec. Sacc. et Syd. a synonym of Guignardiiella q. v.]

[Ascomycetæ.]

XYLOCERAS Annie L. Smith n. g. Pyrenomycetes. Journal of the Linnean Society, London, 35:16. 1 April 1901.

"Stroma erectum, atrum, intus ex hyphis laxis compositum, cellulis corticis et peritheciis parvulus confertis; peritheciis ostiolatis, superficialibus, confertis; ascis 8-sporis, stipitatis; sporis irregulariter bi-seriatis, 1-septatis, brunneis."

[Ascomycetæ.]

XYLOCREA A. Möllig n. g. Sphæriceæ (Xylarieæ). Phycomycteten und Ascomyceten, 307. 1901.

"Fruchtkörper knollenförmig, fleischig, voll, mit einer auf die Unterseite beschränkten, deutlich begrenzten Perithechien tragenden Hymenialfläche. Sporen einzellig, dunkel."

ZIMMERMANNIELLA P. Hennings n. g. Dothidiaceæ. Hedwigia, 41:142. 23 June 1902.

"Stromata follicicola, innato-superficialia, subglobosa, subcornea, verrucoso-rugosa, atra. Perithecia immersa subglobosa vix ostiolata. Asci subfusoides paraphysati, 3-spori. Sporæ monostichæ, oblongæ continuæ, hyalinæ. *Kullhemiae* Karst. aff."

V. LABOULBENIINEAE.

[Laboulbeniineæ]

ACALLOMYCES Thaxter n. g. Laboulbeniaceæ. Proceedings of the American Academy of Arts and Sciences, 38:23. June 1902.

"Receptacle consisting of two superposed cells, the lower sometimes apparently obliterated or indistinguishable from the foot, the upper bearing a single perithecium and an antheridial appendage. Appendage consisting of six superposed cells, the basal cell closely associated with the receptacle and the stalk-cell of the perithecium; the terminal-cell bearing a spine-like process and becoming converted into a simple antheridium, the subterminal-cell cutting off a cell laterally which becomes an antheridium, the remaining cells sterile. Perithecium stalked, normal in structure.

"A genus of very simple structure, closely allied to *Acompsomyces*, from which it differs chiefly from the character of its antheridial appendage."

[*Laboulbeniineæ*]

ACOMPSOMYCES Thaxter n. g. *Laboulbeniaceæ*. Proceedings of the American Academy of Arts and Sciences, 37:37. June 1901.

Receptacles two-celled, bearing an antheridial branch terminally and a single perithecium laterally. Antheridium consisting of several superposed cells from which single simple antheridia are borne directly. The perithecium borne on a stalk, the lumen of which becomes continuous with that of the ascigerous cavity."

[*Laboulbeniineæ*.]

CAINOMYCES, *See Kainomyces*.

[*Laboulbeniineæ*]

CERAIOMYCES Thaxter n. g. *Laboulbeniaceæ*. Proceedings of the American Academy of Arts and Sciences, 36:410. March 1901.

"Structure of the perithecium as in *Lauboulbenia*, its stalk-cell united to the free base of the free stalk-cell of the appendage, which bears a well differentiated basal cell terminally, from the end of which are borne antheridial branches, the successive cells of which produce terminally either successive secondary branchlets or antheridia or both, much as in *Laboulbenia*. Receptacle two-celled."

[*Laboulbeniineæ*]

COREOMYCES Thaxter n. g. *Laboulbeniaceæ*. Proceedings of the American Academy of Arts and Sciences, 38:56. June 1902.

"Mature individual consisting of a single series of superposed cells terminated by a single perithecium. Receptacle attached by a more or less rhizoid-like root and consisting of three superposed cells, the upper of which becomes divided distally by successive transverse septa; these divisions resulting in a series of superposed cells, from each of which arises, on one side, a single branched appendage; the members of the series thus resulting being superposed in a single vertical row. Perithecium consisting of an undifferentiated stalk-cell immediately above the appendiculate cells, which is followed directly by the ascigerous cavity, the septa which separate the basal and wall-cells being obliterated in mature individuals.

"The antheridia of this anomalous genus have not been definitely distinguished, but appear to be similar to those of *Ceratomyces*, to which it otherwise does not appear to be related. The development of the perithecium, in so far as it is shown by the material available, seems distinctly unlike that of any other genus."

(*To be Continued.*)

JOURNAL OF MYCOLOGY

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NOTES.

Mycologists will, it is hoped, find the compilation of New Genera of Fungi very useful — even this first installment which represents the list for the period of three years since 1900. It is intended by the compilers to furnish Supplements from time to time; presently these exact reprints of the author's diagnoses will doubtless be found convenient for workers.

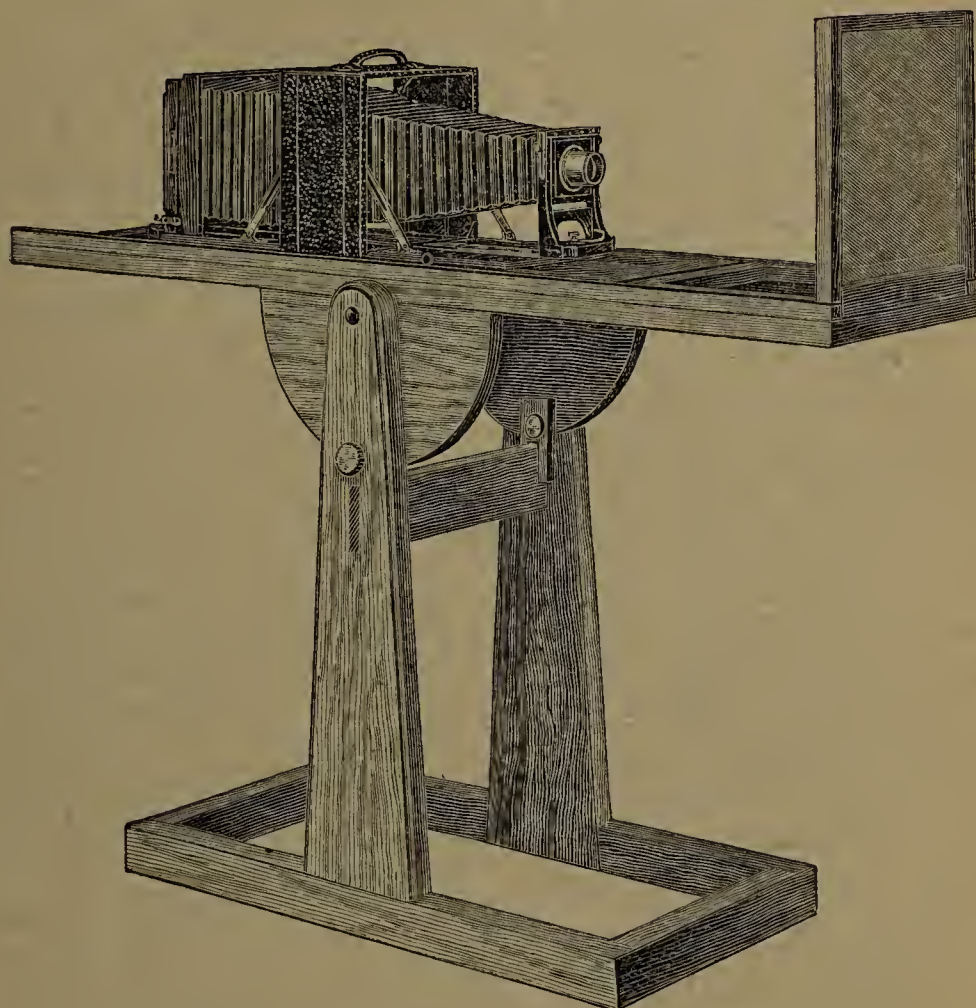
Attention may be called to the *Separate* or Reprint of the New Genera of Fungi, *printed on alternate pages*. The blank page can be used to insert notes, or for a time to receive other reprinted descriptions in their proper order. But the main *purpose* of this arrangement is to allow cutting up for pasting on library cards. The card system in general is indispensable on the part of the working mycologist. The expense of reprinting requires in this case that the price of the *Separate* be fixed at 75 cents.

The concluding portion of the first installment of New Genera will appear in the September JOURNAL.

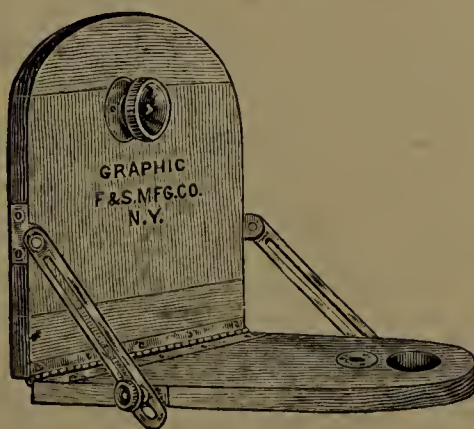
Comments by mycologists are invited relative to the various points made by Saccardo in his timely and excellent *De Diagnostica et Nomenclatura Mycologica*, the translation of which was published in the last number of the JOURNAL. Here I will suggest the infeasibility — I may add the non-necessity — of using the character, " \sphericalangle ," in giving dimensions in length and breadth of microscopic organs. In the first place, "spores $6 \times 5 \mu$ " could scarcely be misinterpreted even by the beginner — and it is to be doubted whether the assertion is justified, namely, that this character between the two numbers is "made use of by mathematicians in another sense." It certainly is as plain as its synonym, or translation in English, *i. e.*, "by," and readily understood without explanation — scarcely the case if the new character is used. In the second place, printing offices do not possess the aforesaid character — the engraver being visited to secure the same for use last month, this justifying and emphasizing the contention I am making.

The next number of the JOURNAL will not post-date nor antedate its appearance, but be received by the subscribers the latter part of September.

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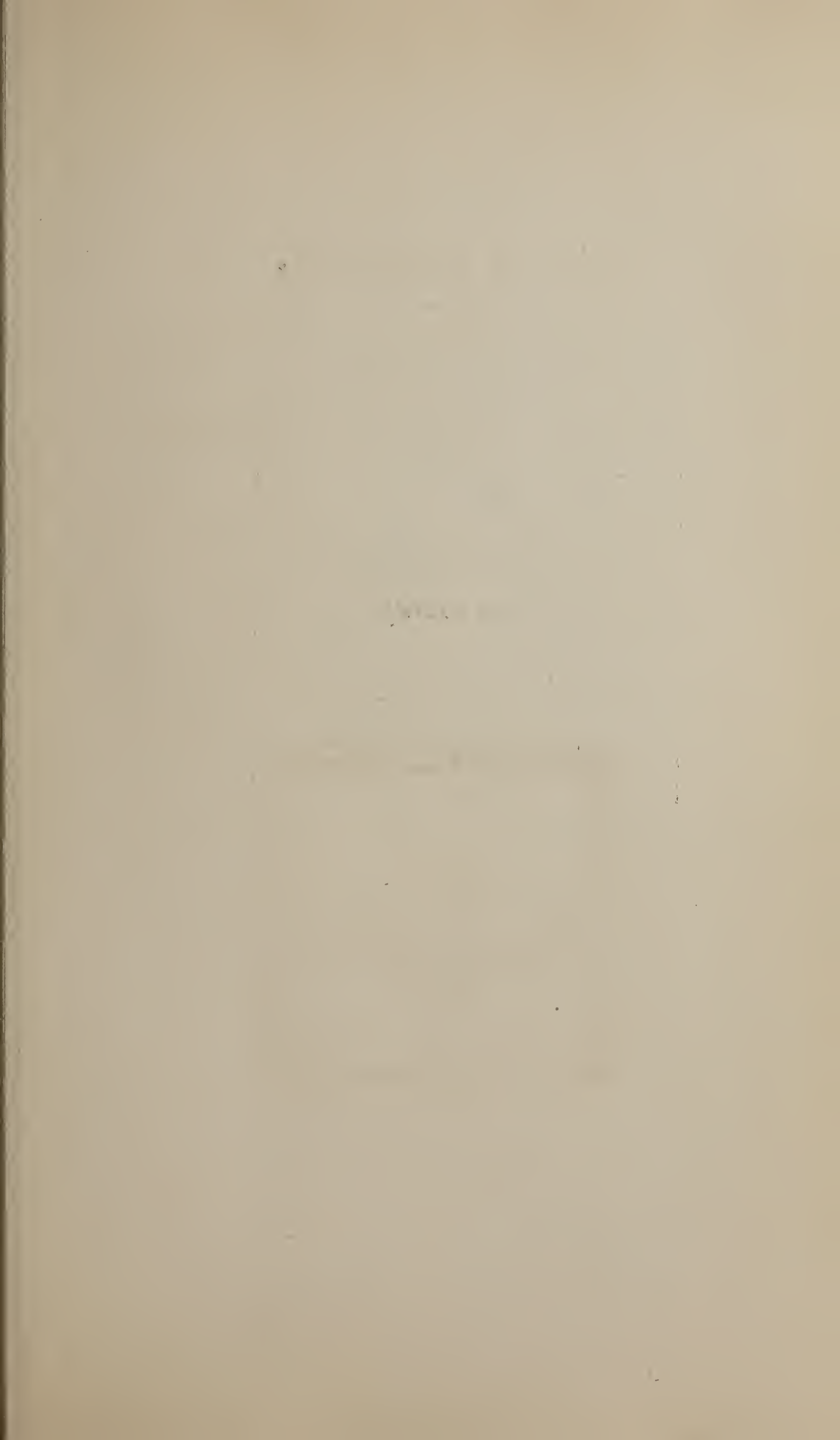


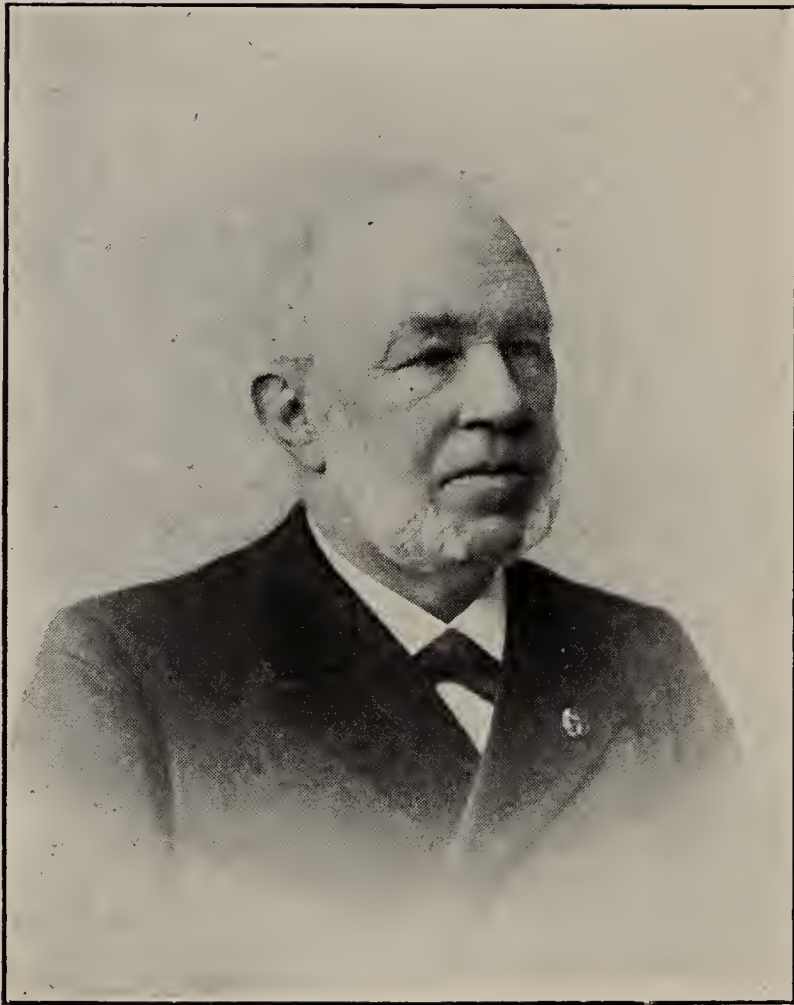
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BENJAMIN MATLACK EVERHART.

We regret to announce the death of B. M. Everhart, one of the former editors of the JOURNAL OF MYCOLOGY, which occurred at his home in West Chester, Pa., Sept. 22, 1904.

He was born March 24th, 1818; was educated in the local schools and West Chester Academy. He early assisted his father in mercantile business and later was the successor in the same — amassing a comfortable fortune. He was interested in the various natural sciences, and formed collections in Botany, Ornithology, Entomology, etc. Botany was his favorite study, but in this he had no special instruction. He had as his companions in this avocation, Dr. Darlington, Ezra Michener, David Townsend, Addison May and Wm. H. Haines, Esq.

The scores and hundreds of “Ell. & Ev.” or “E. & E.” new species of fungi indicate his interest in Mycology and his co-operation with Mr. J. B. Ellis in developing this branch of Systematic Botany in North America. His name is found on the title page, with that of Mr. Ellis and the present editor, of the *first four volumes* of the JOURNAL OF MYCOLOGY.

The genus and the several species commemorative of his name are as follows:

EVERHARTIA Saccardo et Ellis.	<i>Sorosporium Everhartii</i> Ell. & Gal.
<i>Everhartia hymenuloides</i> Sacc. et Ell.	<i>Dothiorella Everhartii</i> Sacc. & Syd.
<i>Melanconis Everhartii</i> Ell.	<i>Gloeosporium Everhartii</i> Sacc. & Syd.
<i>Myriococcum Everhartii</i> Ell. & Sac.	<i>Myxosporium Everhartii</i> Sacc. & Syd.
<i>Ophionectria Everhartii</i> Ell. & Gal.	<i>Phyllosticta Everhartii</i> Sacc. & Syd.
<i>Mucronoporus Everhartii</i> Ell. & Gal.	<i>Physalospora Everhartii</i> Sacc. & Syd.
<i>Pestalozzia Everhartii</i> Sacc. & Syd.	<i>Septoria Everhartii</i> Sacc. & Syd.

PYRENOMYCETES SCARCELY KNOWN IN NORTH AMERICA.

A. P. MORGAN.

CHAETOMIUM ROSTRATUM Speg.

Saccardo, Sylloge XVI, 429.

On dung of Rabbit (*Lepus*). Preston, O. 1902.

TEICHOSPORA PATELLARIOIDES Sacc.

Saccardo, Sylloge II, 300.

On old wood of *Ulmus*, Preston, O. Dec. 1903. Perithecia 0.25-0.30 mm. Asci 90-100 x 12-15 mic. Spores 5-7-septate and muriform, 18-20 x 8-10 mic.

BERTIA FRUCTICOLA P. Henn.

Saccardo, Sylloge XI, 305.

Growing on old nut of *Juglans nigra*, Preston, O. Oct. 1903. Perithecia 0.5-0.6 mm. in diameter. Asci cylindric, with a short stalk, 130-140 x 11-13 mic.; spores fusiform, 1-septate, strongly constricted at the septum, hyaline, each cell 2-guttulate, 20-30 x 5-7 mic.

CUCURBITARIA DELITESCENS Sacc.

Saccardo, Sylloge II, 311.

On corticate branches of *Persica vulgaris*, Preston, O. March 1904. Asci well matured, 140-150 x 15-20 mic.; spores oblong-obovoid, 5-7-septate and muriform, constricted at the middle septum.

EUTYPELLA MICROSPERMA Kalch & Malbr.

Saccardo, Sylloge XI, 275.

On dead branches of *Prunus americana*, Preston, O. March 1904. The spores 5-6 x 1 mic., smaller than in *Eu. prunastri* Pers.

OHLERIA ULMI H. Fab.

Saccardo, Sylloge II, 97.

On *Ulmus americana*, Preston, O. April 1904. Perithecia semi-immersed, a thin white byssus overspreading the wood; in exposed places the byssus soon disappears. Spores fusiform, 20-24 x 4-5 mic.

ZIGNOELLA EBULI Malbr. & Brun.

Saccardo, Sylloge IX, 861.

Growing on Sambucus canadensis. Berlese says it is Lophiostoma praemorsum Lasch. Superficially it looks like a Lophiostoma, but the perithecium opens by a pore every time. The old genus Lophiostoma does not work well as a distinct family.

LASIOSPHAERIA ULIGINOSA (Fries).

Starbäck, Bot. Not. 1893.

(*Lasiosphaeria hirsuta* (Fries) var. *terrestris* Sacc.)

Saccardo, Sylloge II, 191.

I occasionally find this species growing on smooth sandy soil along a stream. The perithecia are gregarious; there is no subiculum, but each perithecium is attached to the soil by hyphae radiating from the base. Asci 140-160 x 18-20 mic.; spores, cylindric, curved, continuous, hyaline, 50-60 x 5-7 mic.

RHYNCHOSTOMA AMERICANUM (E. & E.)

(*Rhynchostoma cornigerum* Karst. var. *americana* E. & E.)

N. A. Pyrenomycetes, p. 196.

The first specimens sent to Ellis were old and broken; specimens found since enable me to furnish the following diagnosis. It will be seen that the species is nearer to *Rhynchostoma exasperans* Karsten than to *Rhynchostoma cornigerum*.

Perithecia large, globose-ovoid, black, superficial, closely crowded together and sometimes connate, seated on a thin, brown subiculum of densely interwoven hyphae; the thick conic rostra usually shorter, scarcely longer than the diameter of the perithecia. Asci cylindric, 8-sporous, paraphysate, 90-120 x 5-6 mic. with the slender stalk; spores elliptic-oblong, inaequilateral, brown, uniseptate, 10-12 x 4-5 mic.

ERIOSPHAERIA INAEQUALIS Grove.

Saccardo, Sylloge IX, 697. (Add. 1886.)

The peculiarity of this species is that the two cells of the spore separate at maturity as in species of *Hypocrea*. I do not consider the accompanying *Hyphomyces* to be *Gonytrichum caesium*, though it is something not far away. This species is certainly very closely related to *Sphaeria pulchriseta* Peck and two or three other forms. The way the species of the simple *Sphaerias* having septate spores are assembled into genera in the Sylloge is an extremely artificial construction.

HYPOXYLON ARGILLACEUM (Pers.)

This species seems to be rare in North America, at least the species as described by Nitschke. I find it on the bark of *Fraxinus americana*. My note upon the fruit differs somewhat from Nitschke's description; it is as follows: Asci cylindric, with a long slender pedicel, paraphysate, 8-sporous, the spores obliquely uniseriate, the sporiferous part 100-125 x 10-12 mic.; the spores simple, elliptic-oblong, inaequilateral, brown, 17-20 x 9-10 mic.

NOTES ON UREDINEAE, III.

E. W. D. HOLWAY.

PUCCINIA ATRO-FUSCA (Dudley & Thompson) Holway n. n. This species was described in this Journal (10:55. March 1904) as *Uromyces atro-fuscus*, and though I have been unable to examine the type specimens I have the same plant on *Carex douglasii* collected by J. S. Colton near Ellensburg, Yakima region, Wash., Aug. 25, 1902. It is a very interesting rust. The supposed teleutospores are typical amphispores, closely resembling those of *Puccinia vexans*. The teleutospores in my specimens are few, intermixed with the amphispores, oblong, the two cells rounded, nearly equal in size, dark brown, smooth, apex rounded, only a little thickened, slightly constricted, 36-40 x 16-22 μ , pedicel hyaline, about the length of the spore.

I find no uredospores, and believe that those described are not uredospores. Their description of the II reads: "Spores scattered among the teleutospores, not abundant, elliptical, 16-17.5 x 26-26 μ , rather thick-walled, echinulate, germ-pores conspicuous, equatorial."

This applies exactly to the amphispores, which are frequently found of this shape and size. An examination of them in lactic acid shows that all the amphispores possess two equatorial germ-pores. Their description mentions a I stage which is evidently an error and was no doubt intended to describe the sori of their supposed II and III stages. Further collections will no doubt enable illustrations and fuller descriptions to be made.

SOME NEW FUNGI FROM WESTERN NEW YORK.

CHARLES E. FAIRMAN.

SPHÆROPSIS THALICTRI Ellis & Fairman n. sp.—Perithecia scattered, covered (permanently ?) by the epidermis which is black and shining over them, minute, $\frac{1}{3}$ – $\frac{1}{4}$ mm. Sporules oblong-elliptical, $24 \times 10\mu$.

On dead stems of *Thalictrum* sp. Yates, Orleans County, N. Y., Sept. 1900.

BOTRYODIPLODIA AMALANCHIERIS Ellis & Fairman n. sp.—Stroma cortical, round or oblong, sometimes confluent. Perithecia small, $\frac{1}{2}$ mm. or less. Ostiola erumpent. Sporules elliptical, brown, uniseptate, constricted at the septum, 18×10 – 12μ .

On dead twigs of *Amelanchier*, Lyndonville, N. Y., 1904.

KARSCHIA CRASSA Fairman n. sp.—Cups sparse, sessile, black, minute (not over $\frac{1}{2}$ mm. in diameter), applanate with a thick, upturned, concolorous rim; asci cylindrical or clavate-cylindrical, $33 \times 13\mu$; paraphyses slender, broader but not septate at the apex; sporidia irregularly biserial, brown, uniseptate, not constricted at the septum, with an oil drop in each half, walls thick, $10 \times 7\mu$.

On decaying wood in the woods, Lyndonville, N. Y., July, 1904.

Differs from *K. lignyota* in its thicker sporidia and shorter asci and from *K. patinelloides* in not having the paraphyses septate-capitate, as well as in being broader and having shorter asci.

PYRENOPEZIZA CEPHALANTHI Fairman n. sp.—Cups, scattered, small, sessile, black outside, disc white at first, growing yellowish then black with age, margin occasionally white; asci clavate-cylindrical, 60×6 – 7μ ; sporidia hyaline, cylindrical or oblong-fusoid, 10 – 13×2 – 3μ , and having from two to four nuclei; paraphyses filiform.

On dead limbs of *Cephalanthus occidentalis*, lying in ditches, Ridgeway, N. Y., Aug., 1904.

LASIOSPHÆRIA OVINA (Pers.) Fuckel, var. *AURELIANA* Fairman n. var.

Sphæria ovina, Pers., 1801. Peck, 22d Rep. N. Y. State Museum, page 99. *Leptosphæria*, N. A. Pyrenomycetes, E. & E., p. 150. *Leptospora*, Feltgen, no. 991.

Perithecia scattered or gregarious, but not crowded, large, ovate-globose, clothed mostly at the base with long brown, bristle like, septate hairs which are 6μ in diameter, simple, or branched, straight or flexuous at the tips, covered with a persistent grayish

white tomentum, all except the protruding papilliform ostiola, which are bare. Inner substance of the perithecia, when crushed upon the slide, flavovirescent: asci straight or curved, oblong sub-fusoid or arcuate, with an occasional shining oil drop in the hyaline, rounded apex, $100 \times 12\mu$; sporidia imperfectly biseriate or fasciculate, abruptly bent at the lower fourth, at times straighter and flexuous in the middle, continuous, hyaline, $40 \times 5\mu$.

The sporidia are at times furnished with a short (about 6μ) acute hyaline tip, at one end or both ends, which appendage may also be absent or indistinct. The appendages are mostly seen in young sporidia and may become absorbed with age. There are small oblong conidia and larger, ($40 \times 6\mu$) multiseptate fusiform spores, found on the basal threads. The paraphyses are indistinct.

On the surface of wood (*Tilia Americana*, "basswood"?) under moist bark. Lyndonville, N. Y., October, 1900. This is no. 302 in an unpublished paper, Fairman, *Pyrenomycetæ* of Orleans County, N. Y. from which this description is extracted, in advance.

Lasiosphæria sulphurella Sacc. is seated on a sulphur colored subiculum and the appendages of the sporidia are $25-30\mu$ long. *Lasiosphæria viridicoma* (C. & P.) is clothed with a dense greenish tomentum and *Lasiosphæria mutabilis* has a yellowish-green tomentum which finally turns brown.

The flavo-virescent color of the crushed perithecia and the occasional appendages of the sporidia render our species different from the type of *L. ovina* (Pers.) At first we considered it a new species (*Lasiosphæria aureliana* Fairman) but Mr. J. B. Ellis, the veteran American pyrenomycetologist, to whom specimens were submitted, thought that the color of the crushed perithecia did not entitle it to specific rank. It is to be noted, however, that in *Eutypa flavo-virescens* (Hoff.) Tul. and *Lecanidion indigoticum* (C. & P.) Sacc., as well as in *Gibberella pulcaris* (Fr.), the interior color of the fungus is a diagnostic feature. *Hypoxylon Sassafras* has also a dirty or rusty yellow stroma which is characteristic. And Mr. Ellis has recently named a species of *Diatrypella* after the yellow stroma, viz., *Diatrypella xanthostroma* E. & E., in the *Journal of Mycology*, Dec., 1903, page 225, and says (loc cit.) "this comes near *D. Frostii* Pk. but the sporidia are longer and the yellow color of the stroma inside is different."

Some day, therefore, our variety may be raised to the rank of a species.

LOPHIOSTOMA CEPHALANTHI Fairman n. sp.—Perithecia immersed in the wood, forming sub-hemispherical mammilloid elevations of the surface, through the center of which the compressed ostiola protrude: asci clavate-cylindrical, tapering into

a long filiform extremity, $100-130 \times 10\mu$; sporidia oblong-fusoid, straight or curved, 5-7-septate, each cell having a nucleus in young sporidia, narrowed at the ends, very slightly constricted at the septa, brown, $27-30 \times 6-7\mu$; paraphyses filiform, nucleolate.

On decorticated area of branch of *Cephalanthus occidentalis*, Ridgeway, N. Y., Aug., 1904.

The sporidia are for the most part arranged as follows: at the top of the ascus one sporidium, then follow four sporidia irregularly biseriate, and lastly three uniseriate sporidia. Comes near to *Lophiostoma macrostomoides* DeN.

HELOTIUM VITELLINUM Rehm, var. PALLIDO-STRIAM Fairman n. var.—Cups about 1 mm. wide, pale straw color outside, the external surface of the disc marked in older specimens with one or two fine circumferential concolorous striae (hardly large enough to make the appearance zonate): stipe pale straw color, 2-3 mm. high, dark at the base, at the disc sometimes ribbed, disc orange red, not dentate: asci clavate cylindrical, $80 \times 10\mu$; sporidia hyaline, oblong cuneiform (rounded at one end, pointed at the other) $17-20 \times 3\mu$; paraphyses filiform.

On fallen petioles in the woods, Ridgeway, N. Y., August, 1904.

Externally paler than the description of Rehm's species which is called vitelline, but the disc is the same in color and the asci and sporidia agree exactly, therefore I call it a variety.

8

A NEW PHYLLACHORA FROM MEXICO.

J. B. ELLIS AND W. A. KELLERMAN.

During the summer plants of *Adolphia infesta* attacked by a fungus were sent for our examination by Mr. A. L. Herrera, City of Mexico. It was at once evident that the parasite was not a Rust by which designation it seems to have been known in that country. It proved to be a species of *Phyllachora*, apparently not hitherto recognized and a technical description (with illustrations) is given below.

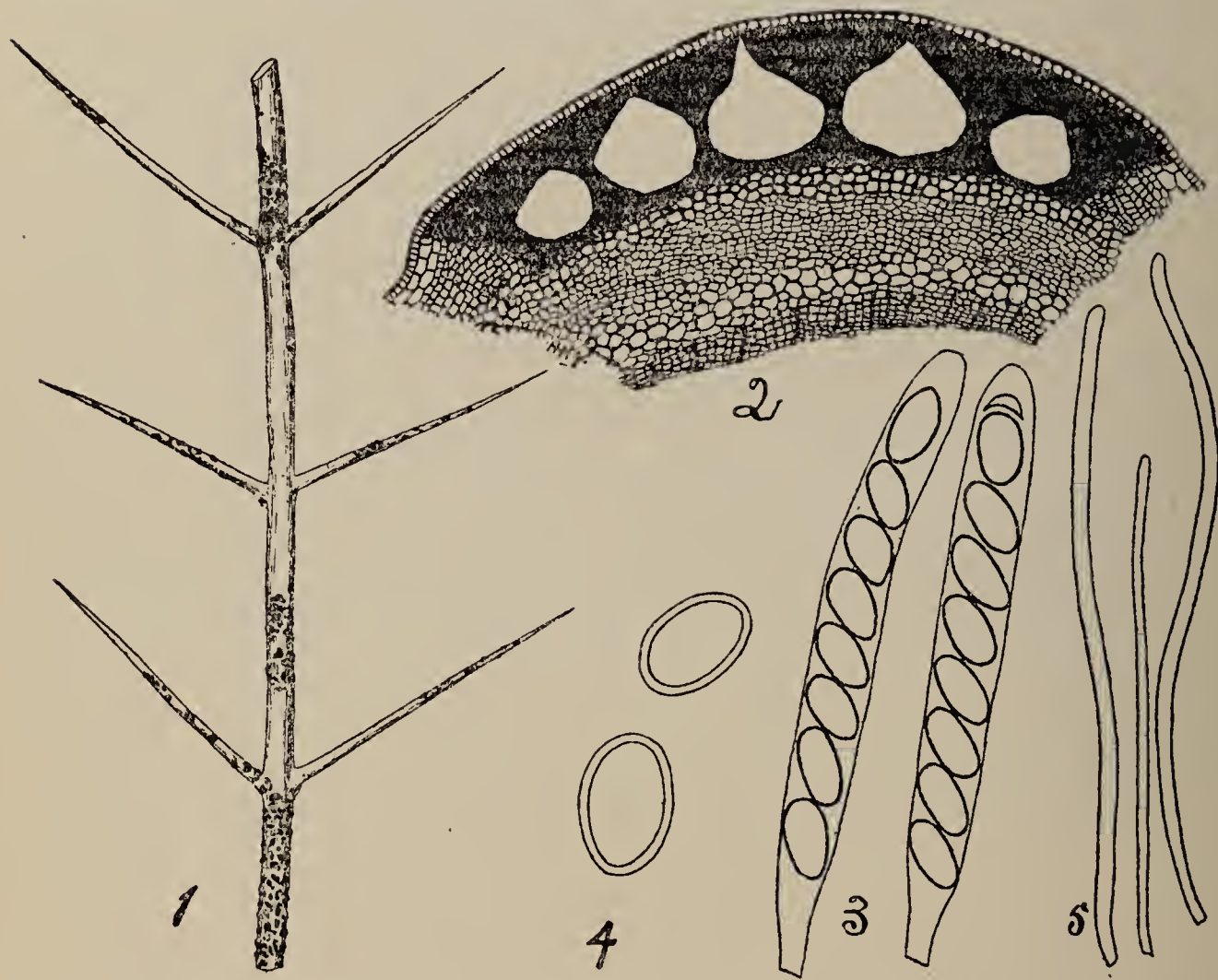
Adolphia infesta is a Mexican member of the family Rhamnaceae, the one other species of the genus occurring in California. It is a striking shrub with opposite spinose branches of olive green color, and leaves small or none.

The stromata of the fungus are scattered or evenly distributed over the stem, here and there more densely clustered, pustuliform or often irregular in shape and elongated, usually less than half a millimeter in diameter, sometimes reaching one

millimeter, black and quite conspicuous. The fungus may be described as follows:

PHYLLACHORA ADOLPHIAE Ell. & Kellerm. n. sp., on *Adolphia infesta* in barley fields at Pachuca, Hidalgo, Mexico, August 3, 1904, A. L. Herrera.

Stromata scattered or more or less definitely grouped in areas on the stems, pustuliform, occasionally elongated and irregular, $\frac{1}{2}$ -1 mm., black. Asci cylindrical, short stipitate, $70-85 \times 10-15 \mu$, accompanied by slender but not abundant paraphyses, $2-3.5 \mu$ in diameter. Sporidia short-elliptical, $12-15 \times 8-10 \mu$, uniseriate, hyaline. Many stromata contain only minute, oblong or allantoid sporidia (spermatia) $4-7 \times 1-1\frac{3}{4} \mu$.



PHYLLACHORA ADOLPHIAE. Fig. 1. A portion of the host plant (*Adolphia infesta*) showing the stromata natural size. Fig. 2. Section through a stroma. Fig. 3. Two asci with ripe spores. Fig. 4. Two spores more highly magnified. Fig. 5. Paraphyses.

NEW GENERA OF FUNGI PUBLISHED SINCE THE YEAR 1900, WITH CITATION AND ORIGINAL DESCRIPTIONS.

COMPILED BY W. A. KELLERMAN AND P. L. RICKER.

(Continued from page 223.)

[Laboulbeniineæ]

DIOICOMYCES Thaxter n. g. Laboulbeniaceæ. Proceedings of the American Academy of Arts and Sciences, 37:33. June 1901.

"Male individual consisting of four superposed cells, the upper of which is a simple antheridium bearing a subterminal discharge tube.

"Female individual. Receptacle ending distally in a peculiarly modified sterile cell, corresponding to the upper spore-segment: the subbasal cell producing a single perithecium laterally, and separated from the sterile terminal cell by a second small cell. Perithecium free, stalked; the ascogenic cell single, the spores more or less obliquely once-septate, and of two kinds corresponding to the sexes."

[Laboulbeniineæ]

ECTEINOMYCES Thaxter n. g. Laboulbeniaceæ. Proceedings of the American Academy of Arts and Sciences, 38:26. June 1902.

"Receptacle consisting of a single series of superposed cells, becoming variable in a number as a result of intercalary division: bearing distally a single perithecium of normal type and an antheridial appendage. The appendage consisting of a series of superposed cells, several of which above its basal or stalk-cell, bear simple antheridia, which are separated distally by oblique septa on one or both sides, much as in the genus *Compsomyces*."

[Laboulbeniineæ]

EUHAPLOMYCES Thaxter n. g. Laboulbeniaceæ. Proceedings of the American Academy of Arts and Sciences, 37:25. June 1901.

"Receptacle consisting of two cells, the upper bearing a free stalked antheridium and a stalked perithecium. Antheridium conical, consisting of a single stalk-cell followed by a basal cell from which is separated a group of smaller cells some of which (two or four?) extend upward and inward to form antheridial cells: above these follow three external marginal cells, the lowest of which lies beside the antheridial cells; the uppermost succeeded by a conical chamber terminating in a pore, and extending downward along the inner sides of the marginal cells to form a cavity into which the antheridial cells empty. Perithecium resembling that of *Haplomyces* and having two ascogenic cells."

[Laboulbeniineæ]

EUMONOICOMYCES Thaxter n. g. Laboulbeniaceæ. Proceedings of the American Academy of Arts and Sciences, 37:21. June 1901.

"Receptacle consisting of a basal and subbasal cell; the latter producing terminally a sterile appendage and laterally a fertile branch (abnormally more than one) the axis of which is coincident with that of the receptacle from which it is not distinguished and consists of a series of superposed cells which may bear a sterile appendage, an antheridium, or an antheridium and a peri-

thecium; the three terminal cells usually bearing these organs in the order mentioned. The antheridia consisting of a single stalk-cell, and a single, often obscure, basal cell; the body of the antheridium consisting of a series of numerous antheridial cells in four (?) vertical rows which extend obliquely inward and upward, emptying into a common cavity, and replace entirely the two tiers of wall-cells and the antheridia of *Monoicomyces*; the terminal cells growing upward directly to form four unequal sterile terminal appendages, similar to those of *Monoicomyces*."

[Laboulbeniineæ]

GUTTULINOPSIS Olive n. g. Sorophoreæ. Proceedings of the American Academy of Arts and Sciences, 37:335. Dec. 1901.

"Myxamoebæ having lobose pseudopodia. Sori sessile or stalked, composed of pseudospores, those of the stalk usually slightly elongated."

[Laboulbeniineæ]

HERPOMYCES Thaxter n. g. Laboulbeniaceæ. Proceedings of the American Academy of Arts and Sciences, 38:11. June 1902.

"Sexual organs normally separated on different individuals. Antheridia simple.

"Male individual consisting of several (four) superposed cells terminated by a characteristically modified spinous or small foot-like process or by both; the basal cell attached by a small normal foot: one or more of the distal cells giving rise to short branches which may bear from one to several antheridia terminally, or become more or less copiously branched; the branchlets terminated by antheridia, or in some cases sterile. Antheridia long, flask-shaped. The subbasal cell of the receptacle sometimes producing a fertile branch as in the female individual from which are produced secondary receptacles which give rise to antheridial branches.

"Female individual consisting primarily, as in the male, of several superposed cells similarly modified at the tip, and attached by a small normal foot; the basal and subbasal cells constituting a "primary receptacle;" the latter giving rise to a variably developed fertile branch (sometimes apparently dividing to several cells each of which may produce a fertile branch) from which is developed a "secondary receptacle," or, as a result of branching, more than one. Secondary receptacles consisting of a partly double series of cells, variable in number, one or more of which may be fertile, the rest sometimes specially differentiated, or unmodified; those in contact with the host perforating the chitinous integument by means of fine haustoria. Trichogynes short filamentous. Perithecium borne on variably developed stalk-cells, the ascigerous portion including three tiers of wall-cells, more or less clearly distinguished from the distal portion, the wall-cells of which are more or less differentiated, four or five in each row.

Spores minute, of the usual type, normally discharged in pairs the members of which produce male and female individuals. Asci apparently eight-spored."

[Laboulbeniineæ]

KAINOMYCES Thaxter n. g. Laboulbeniaceæ. Proceedings of the American Academy of Arts and Sciences, 37:44. June 1901.

"Receptacle much as in Zodiomyces, broad and flattened; consisting of a single basal cell and typical foot, above which the successive cells become variably divided by longitudinal septa into transverse cell-rows or tiers: the distal portion more or less definitely distinguished and consisting of superposed cells, the lowest of which alone become longitudinally divided, all producing laterally antheridial (?) branches: several of the tiers immediately below this appendiculate portion growing out laterally at right angles to the main axis of the receptacle on one or both sides to form "perithecial branches" consisting of superposed cells and terminated by solitary perithecia. The perithecium of peculiar form, with six wall-cells in each row in addition to the lip-cells; the base of the trichogyne persistent in the form of a peculiarly modified unicellular appendage."

[Laboulbeniineæ]

STICHOMYCES Thaxter n. g. Laboulbeniaceæ. Proceedings of the American Academy of Arts and Sciences, 37:37. June 1901.

"Receptacle consisting of two cells, the upper bearing one or more stalked perithecia laterally, and an antheridial appendage terminally. The appendage consisting of several superposed cells, the lowest sterile, or having one or two opposite lateral perithecia; those above it bearing opposite lateral branchlets distally, the series ending in a terminal sterile branch. Antheridia simple, flask-shaped, free, borne in small groups on short branches."

VI. AECIDIOMYCETAE.

[Aecidiomycetæ]

HAPALOPHRAGMIUM Syd. n. g. Uredinaceæ. Beiblatt zur Hedwigia, 40:(64). Mai-Juni, 1901 [20 June 1901].

"Aecidia nulla vel adhuc ignota. Uredosporæ solitarie in apicibus sterigmatum evolutæ, an paraphysatæ. Telutosporæ semper radiatim 3-cellulares, leves, cellulis duabus basalibus pedicello instructis, apicali epedicellata, quaque cellula poro germinationis singulo instructa."

[Aecidiomycetæ]

HYALOPSORA Magnus n. g. Uredineæ. Berichte der Deutschen Botanischen Gesellschaft, 19:581. 1901.

"Von der *Melampsorella Kriegeriana* und von der *Melampsorella Caryophyllacearum* (DC) Schroet. unterscheiden sich sehr auffallend die auf *Phegopteris Dryopteris* auftretende Me-

lampsorella Aspidiotus (Peck) P. Magn. und die auf *Cystopteris fragilis* auftretende *Melampsorella Polypodii* (Pers.) P. Magn. durch ihre Uredolager und Uredosporen. Wie ich in diesen Berichten Bd. XIII (1895), S. 287 schon im Gegensatze zur *Uredo Scolopendrii* (Fckl) Schroet. hervorgehoben habe und l. c. auf Taf. 23, Fig. 6 und 7 abgebildet ist, sind die Uredolager der beiden letztgenannten Arten nicht von einer nur am Scheitel geöffneten Peridie umgeben, sondern ihre Sterigmen und Paraphysen liegen frei unter der aufspringenden Epidermis und sind am Rande von einem Walle von Paraphysen umgrenzt. Ferner sind bei ihnen die Uredosporen mit Keimporen versehen, während die Uredosporen von *Melampsorella Kriegeriana*, wie oben dargestellt, keine Keimporen haben. Ich kann daher diese beiden Arten nicht mehr als Glieder der Gattung *Melampsorella* betrachten und muss sie als Repräsentanten einer neuen Gattung ansehen. Ich nenne diese Gattung *Hyalopsora* (hyaliner Krätzpilz), zu der die zwei Arten *Hyalopsora Aspidiotus* (Peck) P. Magn. auf *Phegopteris Dryopteris* und *Hyalopsora Polypodii* (Pers.) P. Magn. auf *Cystopteris fragilis* gehören. Meine Gattung *Hyalopsora* unterscheidet sich von der SCHROETER'SCHEN Gattung *Melampsorella* vielleicht in etwas analoger Weise durch ihre Uredo, wie sich meine Gattung *Schroeteriaster* von der DIETEL'SCHEN Gattung *Phacopsora* unterscheidet. Die beiden letzteren Gattungen stimmen auch in ihren Teleutosporencharakteren nahe mit einander überein, während sie sich durch die Charaktere ihrer Uredolager so sehr von einander unterscheiden, dass ich im Gegensatze zu DIETEL *Schroeteriaster* in die Verwandtschaft von *Uromyces* ziehe, während *Phacopsora* eine echte *Melampsora* ist. So könnte es sich vielleicht auch später herausstellen, dass *Hyalopsora* mit ihrer von vielen *Melampsoreen* so abweichenden Uredo einer anderen Verwandtschaftsreihe angehört."

[Aecidiomycetæ]

JACKYA Bubák n. n. (Type, *Puccinia cirsii-lanceolati* Schroeter). Oesterreichische Botanische Zeitschrift, 52:42. February 1902.

[Aecidiomycetæ]

NEORAVENELIA Long n. g. Uredineæ. Botanical Gazette, 35: 131. Feb. 1903.

"Spermogonia breaking forth between the cuticle and the epidermal cells, hemispherical. Aecidia without a pseudoperidium, borne cæoma-wise. Uredospores borne singly on short stalks; germ pores few or many; paraphyses usually present in the uredosori. Teleutospores united into cushion-like heads, formed of several or many spores; all the spores of the entire head one-celled; under surface of teleutospore heads with several or many hyaline cells or cysts; pedicel of the head of several

hyphæ, which are either separate or united into a compound stipe."

[Aecidiomycetæ]

PLEORAVENELIA Long n. g. Uredineæ. Botanical Gazette, 35:131. Feb. 1903.

"Spermogonia formed between the cuticle and the epidermal cells, hemispherical. Aecidia with a well developed pseudo-peridium. Uredospores borne singly on short stalks; germ pores few or many; paraphyses usually present in the uredosori. Teleutospores united into cushion-like heads formed of several or many cells; inner teleutospores two-celled by transverse or more or less oblique septa; outer spores one-celled; under side of teleutospore heads with several or many hyaline cells or cysts; pedicel of the head of several hyphæ, which are either separate or united into a compound stipe."

[Aecidiomycetæ]

TRACYA Syd. n. n. (Cornuella Setch.) Ustilaginaceæ. Beiblatt zur Hedwigia, 40:(2). Jan.-Feb. 1901.

[Aecidiomycetæ]

ZAGHOUANIA Patouillard n. g. Melampsoraceæ. Bulletin de la Société Mycologique de France, 17:187. 31 Aug. 1901.

"Sori erumpentes, aurantio flavi, subpulverulenti, pseudo peridio nullo. Uredosporæ ad apicem pedicelli solitariae. Teleutosporæ subcylindrææ transverse pluriseptatæ, dorsaliter adfixæ, inferne læves, superne verruculis ornatae; loculi singuli sporam unicam, sessilem emittentes."

VII. BASIDIOMYCETAE.

[Basidiomycetæ]

BATTAREOPSIS P. Hennings n. g. Secotiaceæ. Beiblatt zur Hedwegia, 41:(212). Nov.-Dec. 1902.

"Receptaculum stipitatum; stipes centralis, subcarnosus, sicco subcorneus, fibrosus; volva coriacea, ampla, laciniato-incisa; peridium pileiformi-hemisphæricum, coriaceum; gleba cellulosa, in locula septis membranaceis sinuosis divisa; capillitium? sparsum; sporæ subglobosæ, subochraceæ."

[Basidiomycetæ]

BORNETINEÆ Mangin et Viala n. div. Comptes Rendus des Séances de l'Académie des Sciences, 136:1701. 29 June 1903.

"Le *Bornetina Corium*, par ses affinités multiples, constitue donc un groupe spécial, celui des *Bornetinees*, que nous rangerons provisoirement entre les Ustilaginées et les Basidiomycètes."

[Basidiomycetæ]

CRYPTOPORUS Shear. n. n. [Cryptoporus Peck ut sec. Polyporus] (Type, Polyporus volvatus Peck). Bulletin of the Torrey Botanical Club, 29:450. July 1902.

[Basidiomycetæ]

DENDROGASTER Bucholtz n. g. Hysteriangiaceæ. Hedwigia, 40:316. 30 Dec. 1901.

“Fruchtkörper unterirdisch, rundlich, etwa haselnussgross, bräunlich gefärbt. Peridie dünn aber deutlich unterscheidbar, aus lose verflochtenen, (beim Verticalschnitt durch den Fruchtkörper) langgestreckten Hyphen bestehend, ziemlich fest an die Gleba angewachsen. Gleba gelblich, von einem aus der polsterartigen Basis entspringenden, baumartig verzweigten (inde nomen) Stranggewebe durchsetzt, welches mit seinen unregelmässigen Aesten bis an die Peridie hinanreicht und mit derselben verwachsen ist. Die labyrinthisch gewundenen Tramaplatten sind centrifugal angelegt; diesselben verwachsen ebenfalls an vielen Stellen mit der Peridie und an den Berührungsstellen seitwärts fortwachsend oft auch mit den benachbarten Tramaästen, so dass rings vom Hymenium bekleidete periphere Hohlräume entstehen. Auch sonst scheinen die Tramaplatten mit einander an Berührungsstellen zu verwachsen. In dem Bau der Gleba gleicht also der Pilz bis auf das gallertartig ausgebildete axile Stranggewebe völlig dem Hysterangium. An Stelle des letzteren findet man ein ausgestreckten Hyphen bestehendes Stranggewebe, welches sich in alle Aeste hinein erstreckt. In diesem Gewebe liegen häufig (nur bei sehr dünnen Schnitten sichtbar) stark lichtbrechende, etwas unregelmässige Hyphen, welche scheinbar in Hymenium ihren Abschluss finden. Die Tramaplatten und das Hymenium sind ganz wie bei Hymenogaster gebaut. Die Sporen sind typische Hymenogastersporen (etwa *H. decorus* Tul. oder *H. Rehsteineri* mihi). Die Basidien, welche nicht oder nur wenig über das Hymenium hervorragen, sind meist 2-sporig. Sporen gelbbraun, auf Sterigmen, länglich ellipsoidisch mit einer unregelmässigen runzlig-faltigen Membransculptur versehen. Sporengrösse (mit kurzem Stielrest und kurzer Papille) im Durchschnitt 20μ lang und 10.7μ breit. Hiervon entfallen auf die Membransculptur beiderseits c. je 1.5μ .

“Wir hätten also eine Pilzform vor uns, welche noch besser als Hysterangium das Anfangsglied der Reihe: — Dendrogaster — Phallogaster — Clathrella — etc. darstellt, ausserdem aber noch verwandtschaftliche Beziehungen zu Hymenogaster durch den Hymeniumaufbau aufweist. Gewiss stehen auch dem Dendrogaster die wenig bekannten Formen wie *Gautieria*, *Gymnoglossum*, *Protoglossum*, *Gymnomyces*, *Chamonixia* u. *Clathrogaster Petri* nahe.”

[Basidiomycetæ]

DICTYBOLE Atkinson n. g. Phallaceæ. Botanical Gazette, 34:42. July, 1902.

“Receptacle a hollow stalk with a chambered wall bearing at the apex a weakly developed pileus covered by the gleba.

Gleba dimorphic, the apical portion traversed by numerous sterile, short, radiating plates; the lower portion with convoluted folds in the form of irregular rings giving a latticed appearance to this portion of the gleba. At maturity the folds of the latticed portion of the gleba uncoil more or less and form long, irregular, loose, netlike folds. Spores single-celled, smooth.—One species, Denton, Texas.”

[Basidiomycetæ]

DICTYOCEPHALOS Underwood n. g. Tylostomaceæ. Bulletin of the Torrey Botanical Club, 28:441. Aug. 1901.

“Plants with the irregularly rupturing peridium closely attached to the solid stem. Volva cup-like, persistent at the base of the stem. Gleba composed of a mesh-like irregular tissue, in which the capillitium threads are imbedded.”

[Basidiomycetæ]

ENDOBASIDIUM Speschenew n. g. Tomentelleæ Bref. (Translation:—) Contributions from the Tiflis Botanical Garden, 5:170. 1901.

“Hymenophora endophyta, numquam epidermidam erumpentibus. Hyphæ steriles valde crassæ et vacuolosæ, septatæ, ad septam sine fusionis. Hymenium leve, interdum leviter undulatum, chlorino-brunneum, dentissime granulatum. Basidia apice truncato-rotundata, 2-sterigmata. Sporæ globosæ, hyalinae posteaquam olivaceo-brunneæ. Conidia minutæ, globosæ, hyalinae, continuæ.”

[Basidiomycetæ]

EOCRONARTIUM Atkinson n. g. Auriculariaceæ. Journal of Mycology, 8:107. Oct. 1902.

“Plants standing out from the substratum, more or less erect, filiform, or columnar, tough, subgelatinous when fresh. Hymenium covering all sides, and exposed. Basidia curved or flexuous, slender, transversely divided, sterigmata about four (vary 3-5, etc.). Spores continuous, white, hyaline, germinating without division and forming one or several threads. One species at present known.”

[Basidiomycetæ]

EOMYCENELLA Atkinson n. g. Hymenomycetes. Botanical Gazette, 34:37, 38. July 1902.

“Plants stipitate. Pileus campanulate to expanded, consisting of a layer of radiating branched threads forming a more or less lattice-like or trabecular, expanded, thin structure; trama wanting or very rudimentary, the subhymenium arising directly from the trabeculæ of the pileus. Hymenium plane, or in larger forms with a few short, narrow, distant lamellæ not reaching the stipe; lamellæ with rudimentary trama. Basidia clavate, 4-spored. Spores smooth, 1-celled, hyaline. Stipe fleshy, delicate. At maturity hymenium dissolving, leaving many of the spores lying on

an amorphous layer against the trabeculæ. — One species, on decaying leaves of *Rhododendron maximum*, Blowing Rock, N. C.

"Eomycenella is related to *Discocyphella* P. Hennings, but differs in the dissolving hymenium and the fact that the pileus is not gelatinous nor the stem horny. From *Cymatella* Patouillard (placed with Agaricaceæ) it differs in the trabecular pileus and the dissolving hymenium; and from *Gloecephala* (Clavariaceæ) Masee, which has one-spored basidia. The latter should be placed in the Thelephoraceæ."

[Basidiomycetæ.]

ETHEIRODON Banker n. n. (*Odontia* Fr.) Bulletin of the Torrey Botanical Club, 29:441. July 1902.

"Fries' name of *Odontia* is preoccupied by *Odontia* Pers., which evidently stands for a very different group. I, therefore, propose the name ETHEIRODON based on *E. FIMBRIATUM* (= *Odontia fimbriata* Fries, *Epicrisis*, 528.)"

[Basidiomycetæ.]

FISTULINELLA P. Hennings n. g. Polyporaceæ. Engler's Botanische Jahrbücher, 30:43. 12 Mar. 1901.

"Pileus carnosus, stipitatus, margine velato-membranaceo involuto. Hymenium porosum, tubuli cylindranei inter se subliberi et separati."

[Basidiomycetæ.]

GEASTEROPSIS Hollos n. g. Gastromycetes. Növénytani Közlemények, 1903, p. 92.

"Exoperidio crasso, rigido in lacinias irregulares dehiscente, in centro stylum sublignosum gerit, qui turbinatè dilatatur, columnellam subrotundam formans. Endoperidio dehiscente.

"Similis Geasteri, at endoperidio dehiscente distincta."

[Basidiomycetæ.]

LACTARIOOPSIS P. Hennings n. g. Agaricacæ. Engler's Botanische Jahrbücher, 30:51. 12 Mar. 1901.

"Pileus carnosus, depressus, margine involuto cum stipite velum membranaceum conjunctus. Hymenophorum cum stipite contiguum; lamellæ adnato-decurrentes inæquales, ceraceæ-rigidulæ, lactescentes. Sporæ globosæ subhyalinae asperulæ."

[Basidiomycetæ.]

LLOYDELLA Bresadola n. g. Thelephoraceæ. Lloyd, Myc. Notes, (121), No. 6:51. May 1901.

"Est *Stereum* hymenio cystidiis prædita. *Prouti* Hymenochaete est *Stereum setulis* prædita)."

[Basidiomycetæ.]

NIDULA White n. g. Nidulariaceæ. Bulletin of the Torrey Botanical Club, 29:270. May 1902.

"Peridium composed of a single homogeneous, but layered membrane which is at first continuous over the mouth much as in *Crucibulum*; sporangioles very numerous, at first immersed in a glutinous substance, very closely packed, entirely filling the central cavity and in no way attached to the peridium wall; no filaments intermixed with the spores."

[Basidiomycetæ.]

PHAEOHYGROCYBE P. Hennings n. g. Agaricaceae. Engler's Botanische Jahrbücher, 30:50. 12 Mar. 1901.

"Pileus submembranaceo-ceraceus; hymenophorum cum stipite contiguum; lamellae acie acutae, hymenio in massam ceraceam mutando vestitae, nec membranaceae; basidia clavata 4 sterigmatibus; sporae globosae echinatae, fuscidulae."

[Basidiomycetæ.]

PHAEOSOLENIA Spegazzini n. g. Polyporaceae. Anales del Museo nacional de Buenos Aires, Series III, 8:53. 1902.

"Char. Fabrica et natura Soleniae sporae ochraceae."

[Basidiomycetæ]

PIROGASTER P. Henn. n. g. Gasteromycetes. Beiblatt zur Hedwigia, 40:(27). Mar.-Apr. 1901.

"Peridium coriaceum, simplex, pisiforme stipitatum extus pallidum; gleba carnosae, violaceae vel brunneae, venoso-reticulata; basidia? Sporae globosae, aculeato-asperatae, coloratae."

[Basidiomycetæ.]

PORODISCUS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 30:432. Aug. 1903.

"Hymenophore small, annual, tough, epixylous, erumpent from the lenticels of dead branches; stipe attached to the vertex of the pileus, usually curvey at maturity; context white, fibrous, tubes, cylindrical, short, one-layered, mouths constricted; spores globose, smooth, hyaline.

"The type of this genus is *Polyporus pocula* (Schw.) Berk. & Curt., first described by Schweinitz as *Peziza pendula* and later as *Ephaeria pocula*. By Fries it was first assigned to the genus *Cyphella* and later formed the basis of the new Friesian genus *Enslinia*, which name, however, was preoccupied by *Enslinia* Rchb. The fruit body matures slowly and resembles a discomycete in its early stages, hence the confusion in regard to its systematic position. The name I have chosen for the genus refers to this resemblance. There is only one species known."

[Basidiomycetæ.]

POTOROMYCES (Müll.) Hollos n. g. Lycoperdaceae. [Potoromyces loculatus Müll. in herb.; Diploderma glaucum Cooke et Mass.] Növénytani Közlemények, 1902, p. 156.

[Basidiomycetæ.]

RHOPALOGASTER Johnston n. g. Lycoperdaceæ. Proceedings of the American Academy of Arts and Sciences, 38:70. 1902.

"Fruiting body clavate, stipitate, traversed by a firm subgelatinous axil columella. Continuous with the stipe. Stipe firm, erect with naked base. Peridium simple, continuous with the stipe below and with the columella at the apex, more or less evanescent-indehiscent. Gleba persistent. Tramal plates extending from the columella toward the peridium. Basidia clavate, in groups, 4-spored, spores simple, borne on well-developed sterigmata."

[Basidiomycetæ.]

RODWAYA Sydow n. n. (Campbellia Cke. & Mass.) Beiblatt zur Hedwigia, 40:(2). Jan.-Feb. 1901.

[Basidiomycetæ.]

TORRENDIA Bresadola n. g. Hymenogastraceæ. Atti dell I. R. Accademia di Scienze Lettere ed Arti degli Agiati in Rovereto. Serie III. Vol. VIII. Fasc. II. Anno 1902.

"Receptaculum stipitato-volvatum. Peridio pileato, convexo-subhemisphærico, ceraceo-subgelatinosa, intus celluloso, a stipite libero; stipite carnosofibroso a peridio discreto; volvo universali ampla, membranacea, persistenti; sporis hyalinis, basiis 1-4-sporis

"Videter *Amanitopsis* gasterospora. Generi *Batarreæ* et *Tylostomatibus* volvatis analogam, sed contextu ceraceo-gelatinosa vel carnosofibroso inter *Hymenogastraceas* locandum."

[Basidiomycetæ.]

TREMELLODENDRON Atkinson n. g. Tremellineæ. Journal of Mycology, 8:106. Oct. 1902.

"In studying the structure of *Thelephora candida* (Schw.) Fr., and *T. pallida* Schw., a little more than a year ago, I was surprised to find that they are not members of the *Thelephoraceæ*, but belong to the *Tremellineæ*, on account of the globose, cruciately divided basidia. They differ quite markedly from any of the described genera of the Tremellineæ, but approach nearest (especially *T. candida*), perhaps, to *Sebacina* Tul. In *Sebacina* Tul., however, the plants are effuse and incrusting, only rising from the substratum in an irregular manner, or when encrusting erect objects, as grasses, herbs, sticks, etc. *T. candida* (Schw.) normally grow erect from the substratum and have a characteristic, more or less dendroid branching. They represent the type of a new genus for which I propose the name *Tremellodendron* Atkinson n. g., with *Tremellodendron candidum* (*Merisma candida* Schw.) and *Tremellodendron schweinitzii* (*Thelephora schweinitzii* Pk., *T. pallida* Schw., not *T. pallida* Pers.) as representative species, at least in part), for it appears that there are true *Thelephoræ* which are nearly or quite impossi-

ble to separate from *T. pallida* Schw., without an examination of the hymenium."

[Basidiomycetæ.]

TREMELLOPSIS Patouillard n. gen. Series des Clavaires. Enumeration methodique des Champignons recueillis a La Guadeloupe & a La Martinique par Le R.-P.-Duss. Lons-le-Sau-nier. 1903.

"Gélatineux-trémelloïde, dressé, foliacé-lobé. Hyménium amphigène, continu. Basides claviformes, non septées, portant au sommet 2-4 stérigmates subulés. Cystides nulles. Spores ocracées..

"T. ANTILLARUM Pat. n. sp. . . .

"Obs.-Ce groupe est allié à *Sparassis* dont il diffère par la consistance tremelloïde et les spores ocracées, caractères qui le rapprochent de *Seismosarca* Cooke, mais que l'absence de cystides et la forme foliacée de son réceptacle éloignent suffisamment."

[Basidiomycetæ]

TYLODON Banker n. n. [Radulum Fr.] Bulletin of the Torrey Botanical Club, 29:440. July 1902.

"The name *Radulum* is untenable, being excluded by *Radula*, established as a genus of the Jungermaniaceæ, by Dumortier in Comment. Bot. Obs. 112. 1822. I propose, therefore, for the name of this genus TYLODON based on T. FREISII (= *Radulum pendulum* Fries, Elenchus Fungorum, 149. 1828; not *Radulum pendulum* Fries, Syst. Orb. Veg. 81. 1825.)".

VIII. DEUTEROMYCETAE.

[Deuteromycetæ.]

ACONTIUM Morgan n. g. Hyphomycetes. Journal of Mycology, 8:4. May 1902.

"Hyphæ decumbent hyaline, septate, vaguely branched, the sporiferous branches uniform, ascending, each producing at the apex several spores which are conglutinate into a pellucid glomerule. Spores simple, cylindric or fusiform, smooth, hyaline.

"A genus somewhat resembling *Cylindrocephalum*, but the spores are involved in mucus as in *Cephalosporium*."

[Deuteromycetæ.]

AEGERITOPSIS v. Höhnelt n. g. Tuberculariaceæ. Annales Mycologici, 1:532. 10 Dec. 1903.

"Tuberculariæ mucedineæ staurosporæ. Sporodochia subglobosa, sessilia, tenuissima, fariacea, epixyla, superficialia, ex hyphis radiantibus, brevibus, crassiusculis, torulosis, coralloideo-ramosis formata. Conidiis pallidis, valde irregularibus, varie brevique ramosis vel lobatis, e cellulis compluribus uniseriatis formatis.

"*Aegeritopsis* sieht äusserlich ganz einer kleinen *Aegerita* gleich, und gehört zu jenen Formen, bei welchen, wie bei *Strumella*, *Illosporium*, *Aegerita* u. a., die Sporenbildung eine wenig ausgesprochene ist, bei denen Sporen und Traghyphen kaum von einander verschieden sind."

[Deuteromycetæ.]

AGYRIELLOPSIS v. Höhnelt n. g. Excipulaceæ. Annales Mycologici, 1:404. 30 Sept. 1903.

"Pycnidia verrucæformia, superficialia, intus trabes complures erectas, basidiis brevibus, ovalibus vel piriformibus dense obtectas gerentia. Tunica infra carbonacea et bene evoluta, supra crasse membranaceo-floccosa, mox evanida. Conidia subhyalina, acrogena, solitaria, minuta, ovata vel bacilliformia, mucidine involuta.

"Est quasi *Agyriella* tunicata."

[Deuteromycetæ.]

ASCHERSONIOPSIS P. Hennings n. g. [Deuteromycetæ? — see in list of Ascomycetes.]

ASCHOCHYTELLA Fl. Tassi n. g. Sphæropsidæ. Bullettino del Laboratorio ed Orto Botanico di Siena, 5:27. 1902.

"Perithecia epidermide velata, lenticularia v. subglobosa, poro pertusa, membranacea, areolas decoloratas foliorum, raro ramulorum incolentia; sporulæ ovoideæ v. oblongæ, minutæ, 1-septatæ, coloratæ."

[Deuteromycetæ]

ASTEROCONIUM Syd. n. g. Melanconiaceæ. Annales Mycologici, 1:36. Jan. 1903.

"Acervuli seu nuclei phyllogeni, erumpentes, diffformes, gregatim dispositi et sæpe irregulariter confluentes, læticolores. Conidia 4-radiata, ex processibus conicis constantia, hyalina. Basidia simplicia, hyalina, longuiscula."

[Deuteromycetæ]

ASTEROGLOEUM Saccardo et Sydow n. sub-gen. Glæosporium. Sylloge Fungorum, 16:1004. 1902.

"Acervuli fibrillis radiosus cincti."

[Deuteromycetæ]

BASISPORIUM Molliard n. g. Dematiaceæ. Bulletin de la Société Mycologique de France, 18:169. 15 Mai 1902.

"Hyphis sterilibus et fertilibus repentibus, diu hyalinis, demum fuscis; ramulis ultimis pleurogena vel acrogena basidia ampulliformia ferentibus. Conidiis solitariis, subsphæricis, levibus.

"Hoc genus prope *Pachybasium* inter Botrytideas et prope *Rhinocladium* inter Trichosporieas sistit."

[Deuteromycetæ]

BONORDENIELLA Penzig et Saccardo n. g. Tuberculariaceæ. Malpighia, 15:259. 1902.

"Sporodochia erumpenti-superficialia, hemisphærico-pulvinata, atra, subfragilia, superficie pulverulenta, ex hyphis ramulosis, septulatis, ochraceo-fuligineis contexta. Hyphæ exteriores, seu sporophora, vage ramulosæ, parce septatæ, inæquales. Conidia globoso-angulosa, catenulata, inæqualiter cruciatim vel radiatim septata, fuliginea.—Est omnino generi *Trimmatostromati* parallelum, sed dictyosporum. Occupabit inter Tuberculariaceas dematieas numerum 267. Cfr. Sacc. *Tab. comp.* p. 61."

[Deuteromycetæ]

BUSSELLA P. Hennings n. g. Mucedinaceae. Engler's Botanische Jahrbücher, 33:40. 1902.

"Hyphæ fertilis erectae, simplices, septatae, apice clavatae vel subpalmatae. Conidia acrogena, haud catenulata, ovato-ellipsoidea, colorata, basidia breves. Cephalosporiaceae. Oedocephalo affinis."

[Deuteromycetæ]

CAMAROSPORELLUM Tassi n. g. Sphæropsideæ. Bulletino del Laboratorio ed Orto Botanico di Siena, 5:62. 1902.

"Perithecia globosa, membranacea, maculicola; sporulae minutæ, ovoideæ v. piriformæ, pluriseptato-muriformes, coloratæ, in *C. Eucalypti* Wint. basidiis brevibus suffultæ."

[Deuteromycetæ]

CAMAROSPORULUM Fl. Tassi n. g. Sphæropsideæ. Bulletino del Laboratorio ed Orto Botanico di Siena, 5:63. 1902.

"Perithecia subcutaneo-erumpentia, globulosa v. depressa, atra, membranacea v. subcoriacea; sporulae ovoideæ v. oblongæ, minute, 2-pluriseptato-muriformes, coloratæ."

[Deuteromycetæ]

CEPHALIOPHORA Thaxter n. g. Hyphomycetes. Botanical Gazette, 35:157. March 1903.

"Vegetative hyphæ copious, branching, septate, colorless. Sporophores arising as short branches from the hyphæ, which become more or less abruptly enlarged distally to form a variably differentiated head, from the surface of which the spores are produced. Spores once to several times transversely septate, becoming brownish, the sterile basal segment narrowed to form a more or less distinct pedicellate attachment."

[Deuteromycetæ]

CERCOSPORIDIUM Earle n. g. Dematiaceæ. Muhlenbergia, 1:16. July, 1901.

"Biophilus: sporophores elongate, soft, pannose, fasciculate: conidia acrogenous and pleurogenous, oblong, oval or ovate, once or several septate.

"This is related to *Cercospora*, but differs in the long thread like sporophores and in the broader and shorter conidia. As the

type of this genus I take the species published as *Scolecotrichum* (?) *Euphorbiae* Tracy & Earle, Bull. Torr. Bot. Club, 23:209, also as *Piricularia Euphorbiae* (T. & E.) Atkinson, Bull. Cornell Univ. 3:40."

[Deuteromycetæ]

CILIOSPORA Zimmermann n. g. Nectrioidaceæ. Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, Zweite Abteilung, 8:217. 17 Feb. 1902.

"Pykniden oberflächlich, gallertartig. Sporen einzellig, hyalin, an der Oberfläche mit dünnen Fäden, die mit den Cilien von Bakterien eine äusserliche Aehnlichkeit haben."

[Deuteromycetæ]

CIRRHOMYCES v. Höhnelt n. g. Dematiæ. Annales Mycologici, 1:529. 10 Dec. 1903.

"Cæspitulis effusis. Hyphis sterilibus obsoletis; hyphis fertilibus erectis, simplicibus, brunneis, membrana externa in apice dehiscente; sporulis, globosis vel oblongis, hyalinis, continuis, ex membrana interna apicale germinantibus et 5-6 fariam in cirrhum longum, conglutinatum congestis."

[Deuteromycetæ.]

COLLODOCHIUM v. Höhnelt n. g. Tuberculariæ. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe, Wien, 111:1029. 1902.

"Sporodochiis superficialibus, subsphaeroides vel verruciformibus, gelatinoso-carnosis, e hyphis pallidis, suparallele et irregulariter ramosis, radiatim dispositis et dense stipatis formatis; conidiis continuis, hyalinis, subglobosis vel ellipsoideis, catenulatis, acrogenis, mucidine omnino involutis."

"Differt ab *Dendrodochium* sporis catenulatis mucidine omnino involutis."

[Deuteromycetæ]

DEUTEROMYCETAE Sacc. n. n. [Sphæropsideaceæ (Lev.) Sacc.] Sylloge Fungorum, 16:825. 1 Feb. 1902.

[Deuteromycetæ]

DIDYMOSTILBE P. Hennings n. g. Stilbaceæ. Hedwigia, 41:148. 5 Aug. 1902.

"Stromata teretiuscula apice capitato-conidiophora, ex hyphis hyalinis coalitis conflata. Conidia acrogena oblonge subfusoides, hyalina, 1-septata."

[Deuteromycetæ]

DIPLODINULA Fl. Tassi n. g. Sphæropsideæ. Bulletino del Laboratorio ed Orto Botanico di Siena, 5:41. 1902.

"Perithecia subcutanea v. erumpentia, globulosa v. depressa, membranacea, rami-caulicola. Sporulæ oblongæ, minutæ, 1-septatæ, hyalinæ."

[Deuteromycetae.]

DIPLO RHINOTRICHUM v. Höhnelt n. g. Mucedineae. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe, Wien, III:1040. 1902.

"Saprophyticum. Hyphis sterilibus septatis, hyalinis, repentibus, fertilibus erectis, subsimplicibus, in apice denticulato sporigeris; conidiis oblongis vel cylindraceis, hyalinis vel laete coloratis, didymis.

"Est *Rhinotrichum* conidiis didymis."

[Deuteromycetae.]

GLIOBOTRYS v. Höhnelt n. g. Dematieae. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe, Wien, III:1048. 1902.

"Hyphis sterilibus parvis, repentibus; hyphis fertilibus erectis, hyalinis, apice vix inflatis, coronam compactam e ramulis brevibus, hyalinis, simplicibus, verticillatis gerentibus; conidiis olivaceis, continuis, ellipsoideis, mucedine obvolutis, in capitula globosa congestis.

"Est *Stachybotrys* hyphis hyalinis et conidiis mucedine obvolutis."

[Deuteromycetæ]

GYMNODOCHIUM Mass. et Salm. n. g. Tubercularieae. Annals of Botany, 16:89. March 1902.

"Sporodochia subglobosa vel irregularia, superficialia, convexa, nuda, i. e. setis destituta; conidiis catenulatis 1-septatis hyalinis in conidiophoris distinctis acrogenis. — Genus *Endodesmiae* inter *Tubercularieas mucedineas* sectionis *Didymosorae* solum comparandum; ab hoc setarum repectu longe recedens."

[Deuteromycetæ]

GYMNOSPHERA Fl. Tassi n. g. Sphaeropsidae. Bulletino del Laboratorio ed Orto Botanico di Siena, 5:78. 1902.

"Perithecia globulosa, papillata, sub-coriacea, superficialia v. basi ligno insculpta; sporulae oblongae pluriseptatae, hyalinae. — Est *Stagonosporina* superficialis et inter Deuteromycetæ Sphaeroidaceae occupabit n. 86. Cfr. Sacc. Tabul. Compar. p. 41."

[Deuteromycetæ]

HAPLARIOPSIS Oudemans n. g. Mucedineae. Ned. Kr. Arch. 3e Ser. II.-4. p. 902. 1903.

"Saprophile. Hyphes fertiles absolument simples, allongées, égales (sans nœuds), portant des conidies sessiles de couleur gaie, solitaires, lisses, arrangées en spirale autour de l'axe."

[Deuteromycetae.]

HELICOSTILBE v. Höhnelt n. g. Phaeostolbeae. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Mathematische-Naturwissenschaftliche Classe Wien, III:1028. 1902.

"Subiculo tenui, e hyphis sterilibus, repentibus, plectenchymatico intricatis formato; fasciculis fertilibus densiuscule stipatis, quasi velutinum formantibus, acutis, erectis, e setis brunneis, rigidis, septatis, crassiuscule tunicatis, cuspidatis atque e hyphis fertilibus, hyalinis, parallele stipatis, extus ramuligeris formati; sporis in ramulis acrogenis et pleurogenis, filiformibus, spiraliter arcte contortis."

"Die Sporen dieser neuen Formgattung sind genau dieselben wie die von *Helicomycetes* und *Helicosporium*. Die farblosen Fruchthyphen bilden jedoch im Vereine mit braunen, steifen, sterilen Stützyphen zotten- oder stachelartige Fruchtkörper, die auf einer Art dünnen Subiculum, ähnlich den *Odontia*-Arten, aufsitzen; der Pilz ist daher eine *Phaeostilbeae*.

[Deuteromycetæ]

HELOSTROMA Patouillard n. g. Tuberculariaceæ. Bulletin de la Société Mycologique de France, 18:52. 25 Jan. 1902.

"Le *Fusisporium album* de Demazières présente une conformation toute spéciale et doit être rapporté à un genre particulier, que nous désignerons sous le nom d'*Helostroma*.

"Ce Champignon croît en parasite dans les feuilles des différents Chênes, nous l'avons reçu récemment d'Algérie sur celles du *Quercus aegilops*.

"Son mycélium forme de petites masses stromatiques arrondies et blanches, logées dans le parenchyme lacuneux des feuilles, principalement en dessous des stomates; ces tubercules à structure filamenteuse, sont larges d'environ 25 μ et émettent une colonne dressée, cylindracée, blanche, haute de 25 à 35 μ , sur 7-10 μ d'épaisseur, tronquée au sommet, qui émerge au dehors par l'ouverture des stomates et porte les frutifications.

"Cette colonne est composée de filaments incolores, cylindriques, parallèles, de 2 à 3 μ d'épaisseur, fortement accolés entre eux, inégalement allongés et qui portent près de leur extrémité un renflement latéral, obus, très-court, sur lequel naissent les conidies. Ces renflements sont groupés en une couronne qui entoure le sommet de la colonne; parfois on observe une deuxième couronne vers le milieu de la hauteur.

"Les conidies naissent par 6-7 sur chaque renflement; elles sont incolores, droites, ellipsoïdes et mesurent 5-6 x 2-3 μ .

"Ce parasite a été rangé successivement dans les genres *Fusisporium*, *Fusidium*, *Torula*, *Coniosporium*, mais ne peut rester dans aucun de ces groupes. Plus récemment M. SACCARDO l'a placé dans le genre *Microstroma*, à côté du *M. Juglandis*, mais l'analyse publiée dans les *Fungi italici* no. 863, ainsi que la description du *Sylloge* (IV, 9) se rapportent évidemment à une espèce entièrement différente, caractérisée par des basides claviformes et *monospores*.

"Nous avons examiné les spécimens publiés dans les exsiccata de DESMAZIERES, MOUGEOT, THUMEN ET RABENHORST et nous avons toujours rencontré l'organisation que nous avons indiquée plus haut.

"*Helostroma* se rattache aux Tuberculariés et n'est pas comparable à *Microstroma*."

[Deuteromycetæ]

HENDERSONULINA Fl. Tassi n. g. Sphæropsideæ. Bullettino del Laboratorio de Orto Botanico di Siena, 5:56. 1902.

"Perithecia globosa v. depressa, membranacea v. subcarbonacea, rami-caulicola v. raro fructicola; sporulæ oblongæ, minutæ, 2-pluriseptatæ, coloratæ."

[Deuteromycetæ]

HETEROCEPHALUM Thaxter n. g. Hyphomycetes. Botanical Gazette, 35-157. March 1903.

"Vegetative mycelium consisting of fine, septate branching, colorless hyphæ growing on and in the substratum. Fertile hyphæ abruptly differentiated, erect, stout, swelling distally to form a well-distinguished terminal head, the whole surface of which gives rise to sporophores several times subumbellately branched, the ultimate branchlets adjoining successively continuous hyaline spores. The fertile hypha corticated by sterile hyphæ which grow upward with it, eventually forming a special envelope about the sporiferous portion of the head."

[Deuteromycetæ]

HOEHNELIELLA Bresadola et Saccardo n. g. Phæostilbaceæ. Verhandlungen der k. k. zoologisch-botanischen Gesellschaft in Wien, 52:437. 1902.

"Stroma (stipes teretiusculum, verticale, rigidulum, atrum; hyphæ interiores fasciculatæ, hyalinæ, conidiophoræ, externæ nigricantes, compactæ, in setas rigidas ascendentes, obscuriores relaxatæ. Conidia oblongo-fuscoïdæ, medio tenuiter uniseptata, apice ciliata, e hyalino chlorina.

"A Didymobotrio Sacc. præcipue conidiis apice ciliatis recedit. Ob stromatis fabricam perithecidideam ad Rhynchophoma quoque nutat."

[Deuteromycetæ]

HYALOTHYRIDIMUM Fl. Tassi n. g. Sphæropsideæ. Bullettino del Laboratorio ed Orto Botanico di Siena, 5:67. 1902.

"Perithecia subcutaneo-erumpentia papillata, subcarbonacea, nigra; sporulæ oblongæ, pluriseptato-muriformes, hyalinæ. Est *Camarosporium* sporulis hyalinis."

[Deuteromycetæ]

HYPHASTER P. Hennings n. g. Phæostilbaceæ. Baum's Kunene-Sambesi Expedition, 169. 1903.

"Stromata annuliformia asteroidea e hyphis fuscis conflata, basi hyphis repentibus circumdata. Conidia ovoidea vel ellipsoidea, 1-septata, fusca, intra annulum apice conidiophori brevi."

[Deuteromycetæ]

HYPOTHYRIUM Sacc. et Syd. n. subg. Leptothyrium. Sylloge Fungorum, 16:989. 1 Feb. 1902.

"Perithecia diu subtectata."

[Deuteromycetæ]

KMETIA Bres. et Sacc. n. g. Tuberculariaceæ. Sylloge Fungorum, 16:1158. 1 Feb. 1902.

"Sporodochia minuta, pulvinata v. granuliformia, superficialia, gelatinoso-ceracea, pallida v. læte colorata, glabra, parte inferiore ex hyphis filiformibus, parallele denseque coalitis formata. Conidia ex apice hypharum oriunda, acicularia, continut, hyalina. A gen. *Cylindrocolla* differt defectu basidiorum ramosorum, conidiis non catenulatis, etc. Forte *Cylindrocolla Pini* Lamb. et Fautr. ad hoc genus spectat."

[Deuteromycetæ]

LISTEROMYCES Penzig et Saccardo n. g. Tuberculariaceæ. Malpighia 15:258. 1902.

"Sporodochia verticaliter cylindracea v. clavata, interdum bifida, carnosula, majuscula, extus atra, glabra, intus alba, ex hyphis teretiusculis dense ramoso-intricatis contexta. Sporophora sporodochii superficiem fere totam obtegentia, patula, brevissima, cellulis conico-papillatis fuscescentibus 1-septatis intermixta. Conidia ovoidea, crebre transverse septata, atra. Genus cum nullo noto comparandum, prædistinctum. *Exosporium* obiter visum accedit, sed structura omnino alia."

[Deuteromycetæ]

MICRODIPLODIA Allescher n. g. Sphærioideæ. Rabenhorst's Kryptogamen-Flora, 2 Auf., Die Pilze, VII Abt. 78. 1901. [Date on title page, 1903.]

"Fruchtgehäuse zerstreut oder herdenweise, erst von der Epidermis bedeckt, dann hervorbrechend, hier und da fast oberflächlich, fast kohlig oder häutig, klein, schwarz, meist mit Mündungspapille; Sporen länglich oval, elliptisch, eiförmig, oder verkehrt eiförmig, dunkel gefärbt, bis 15 μ lang."

[Deuteromycetæ]

MICRODIPLODIA Fl. Tassi n. g. Sphæropsideæ. Bullettino del Laboratorio ed Orto Botanico di Siena, 5:29. 1902.

"Perithecia subcutanea, dein erumpentia, membranacea v. subcoriacea, globosa v. depressa, minute ostiolata; sporulæ ovoideæ v. oblongæ, minutæ, 1-septatæ, coloratæ."

(To be Continued.)

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POLYPORUS hispidulus B. & C., *syn. of Hapalopilus hispidulus q. v.*

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- TRAMETES cinnabarina Fr., *syn. of Pycnoporus cinnabarinus* q. v.
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ZEAL mays, host to *Phyllachora maydis* Maublanc n. sp. *Bull. Soc. Myc. France*, 30:72. 30 April 1904.

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NOTES FROM MYCOLOGICAL LITERATURE. XII.

W. A. KELLERMAN.

THE BRITISH MYCOLOGICAL SOCIETY TRANSACTIONS FOR THE SEASON 1903, pp. 41-67, three colored plates, has the following contents: Report of the Savernake Forest Foray and complete list of Fungi and Mycetozoa gathered; Mycology as an instrument of recreation (Rev. W. L. W. Eyre); Occurrence of *Echinostelium minutum* (G. & A.) Lister; Diseases of Plants due to Fungi (Miss A. Lorrain Smith); Notes on Fungi recently collected (Miss A. Lorrain Smith); Two Phalloideae new to Europe (Carleton Rea); Fungi new to Britain.

ROLAND THAXTER'S NOTES ON THE MYXOBACTERIACEAE, Contributions from the Cryptogamic Laboratory of Harvard University, LVI, with plates XXVI and XXVII, is a model piece of literature and record of invaluable work on an interesting group of organisms. Dr. Thaxter vigorously controverts the view of Zederbauer, namely, that the Myxobacteriaceae as an independent order of organisms has no real existence; and that the conditions supposed to have been observed merely represent a symbiotic association between ordinary Eubacteria and hyphomycetous molds. Dr. Thaxter regards this as a novel and somewhat hasty view since the figures and descriptions in that author's paper show as yet a non-acquaintance with any member of the order he discusses. Besides the critical and historical part, the article in the *Botanical Gazette* contains descriptions of eight new species — amply illustrated.

IN THE 60TH BULLETIN OF THE BUREAU OF PLANT INDUSTRY, U. S. Department of Agriculture, by C. O. Townsend, issued June 30, 1904, the title of which is A soft Rot of the Calla Lily, we learn that the fomenter of the disease is a hitherto undescribed bacterium, namely, *Bacillus aroideae* Townsend n. sp. It was isolated from rotting Calla corms and is the cause of a soft rot of the corm, petiole, and flower stalk of the Calla. It also causes — says the author — a soft, dark colored rot when inoculated into many raw vegetables, such as carrot, potatoe, turnip, radish, cabbage, and cauliflower. It also causes a soft rot of certain green fruits, such as tomatoe, egg plant, and cucumber. There are text figures by way of illustration in addition to nine full page half tone plates.

E. ROSTRUP gives in a 44-page reprint [Videnskabs-Selskabets Skrifter, I, Math.-naturv. kl. 1904, No. 4] the *Norske Ascomycetes*, with localities and hosts. Nearly two dozen new species are described lingua latina.

TO THE MANY SPECIES OF ASPERGILLUS AFFECTING FRUITS, G. Lindau in Hedwigia, Band 43, Heft 5, p. 306-7, adds yet another, namely, *Aspergillus* (*Sterigmatocystis*) *strychni* Lindau n. sp. Die neue Art unterscheidet sich von den bisher bekannten durch die riesenhaften Dimensionen der Konidientraeger und die Sterigmen.

INVESTIGATIONS OF RUSTS BY MARK ALFRED CARLETON, is an interesting Bulletin (No. 63) of the U. S. Department of Agriculture, Bureau of Plant Industry, issued July 12, 1904. Notes are given on life histories of Euphorbia Rust, Sunflower Rust, Crown Rust of Oats, supplementing and corroborating previous published reports; also experiments with *Puccinia xanthii* Schw. and *P. heterospora*. The other topics are Segregation of host plants, Winter resistance of *Uredo* (of *P. poarum* Niels. and *P. montanensis* Ell.), Emergency adaptations (*P. vexans* Farl.), and Perennial species (*Aecidium tuberculatum* E. & K., and the rust on *Peucedanum foeniculatum*). Colored plates are given of *Aecidium tuberculatum* and of the Euphorbia Rust and *Puccinia vexans*.

THE EFFECT OF CHEMICAL IRRITATION ON THE RESPIRATION has been experimentally investigated by Ada Watterson, whose report is found in the Bulletin of the Torrey Botanical Club for May 1904, pp. 291-303. She outlines the work of previous investigators and summarizes the results quoted: we find that small quantities of certain poisonous substances act as stimulants, increasing the growth of certain plants; they also increase respiration, but what relation the latter increase bears to the former is not determined. In case of fungi stimulation

allows the plant to make use of the sugar to form a greater amount of dry substance in a given time; hence the important question of the amount of CO_2 which is produced at the same time — the objective point of the work here reported.

THE ARTICLES IN THE BULLETIN DE LA SOCIÉTÉ MYCOLOGIQUE DE FRANCE, XX 2e fascicule are as follows: N. Patouillard, Champignons algero-tunisiens; M. Molliard, Forme conidienne du *Daldinia concentrica*; Hariot et Patouillard, Champignons nouveaux de l'Herbier du Museum; A. Vast, A propos de la culture d'*Oospora destructor*; Maublanc, Espèces nouvelles de champignons inférieurs; E. Boulanger, La culture artificielle de la truffe.

JAMES VANHOOK IN CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION BULLETIN 219, gives an account, with numerous illustrations, of some of the diseases of Ginseng. The "Wilt" is caused by *Acrostalagmus albus* Pr., and Damping off by *Rhizoctonia*. Other diseases are discussed, as Nematode Root Gall, Black Rot, Soft Rot, and *Alternaria* or Leaf-spot.

A BRIEF POPULAR ACCOUNT OF THE BLACK FUNGI, PYRENO-MYCETES, is given by C. L. Shear in the July No. of the Plant World, pp. 172-4. Of the ten thousand or more species which have been described, the complete life history of perhaps less than one hundred is known, and so the author states that those who are looking for a fertile field for research can here find problems in abundance, either biologic or taxonomic.

THE REPORT OF THE BOTANICAL DEPARTMENT OF THE NEW JERSEY AGRICULTURAL COLLEGE EXPERIMENT STATION FOR 1903, by Byron D. Halsted and James A. Kelsey contained seven mycological items — the most extensive being that pertaining to the Powdery Mildews, pp. 517-536, illustrated by two plates. The treatment is popular and concludes with a preliminary list of the species (22) of powdery mildews of cultivated plants, with the leading hosts under each.

ONION BLIGHT (*PERONOSPORA SCHLEIDENIANA*) by H. H. Whetzel is Bulletin No. 218, Cornell University Agricultural Experiment Station, and treats in extenso a serious outbreak of Onion Blight in 1903 — the first part being a popular account of the disease with remedies; part second is a more technical account of the Onion Blight and other diseases, illustrated by several text figures.

A REMARKABLE LICHEN was described by Briosi et Farneti in Atti del Ist. bot. dell Università di Pavia, VIII, 1902, under the title *Intorno ad un nuovo tipo di Licheni a talle conidifere che vivono sulla Vite, finora ritenuti per Funghi*. The plant,

heretofore grouped with fungi, produces conidia as well as ascospores. The conidiophores are branches, each extremity bearing 2-4 conidia; these are fusiform slightly curved, hyaline, 3-5-septate and $50 \times 4\mu$. Hence the plant was called by Corda a *Fusarium* (*F. biasolettianum*); it was placed by Fries in the genus *Pionnotes* (type, *Fusarium capitatum* Schw.), and in the *Sylloge* included in the *Tuberculariaceae*. The authors create a new genus of Lichens, namely, *Chrysogluken*, which includes two of four recorded species of *Pionnotes*, namely, *C. biasolettianum* (Corda) and *C. casatii* (Thüm.) — placed in a new family, *Chrysoglukenaceae*.

BACTERIA, YEASTS AND MOLDS IN THE HOME, by H. W. Conn has been recently published (1903) by Ginn & Company of Boston. This is a useful book of 293 pages suitable for general readers and for classes in educational institutions. Bacteria are treated on pages 100-125.

THE AECIDIUM OF MAIZE RUST, J. C. Arthur, Botanical Gazette, July 1904 (pp. 64-7), is an interesting account of a clue to the connection of *Aecidium* on *Oxalis* with *Puccinia sorghi* Schw., and the culture experiments verifying the same. It is remarkable that the *Aecidium oxalidis* Thüm. should have been so rarely collected since the Maize Rust is both common and often abundant. Can it be that this stage in the life cycle is generally suppressed?

AN EXTENDED AND ILLUSTRATED ACCOUNT OF THE WATER-RELATION OF PUCCINIA ASPARAGI, is given by Ralph E. Stone in the July No. of the Botanical Gazette, 1904, (pp. 19-43), as "a contribution to the Biology of a parasitic fungus." The study was made in California; it is shown that dew is of absolute necessity in infection by the rust and of more importance than the rain; without such moisture no infection can take place. Dry atmosphere checks aecidial development; uredo development is similarly checked, and changes to a production of teleutospores. An abundance of soil moisture during the summer has a marked effect in retarding the development of this fungus by giving the host greater vitality and resistance.

BRUCE FINK gives Further Notes on *Cladonias*, III, *Cl. furcata* and *Cl. crispata*, in the July No. of the Bryologist. Many varieties are enumerated in the light of Wainio. *Cladonia furcata* and five varieties, also one variety of *Cl. crispata*, are figured. Professor Fink says "regarding the illustrations, we are fortunate enough this time to be able to give them all from material that has been examined by Dr. Wainio."

UNDER THE TITLE OF MYCOLOGICAL NOTES in the Journal of Botany, p. 182, Ernest S. Salmon gives an account of the

formation of ascospores in *Erysiphe graminis*. He developed the fact of some interest that *E. graminis* is able, under favorable circumstances, to produce, as soon as the perithecium is formed, ascospores which are capable of at once infecting the host plant.

ERNEST S. SALMON'S PAPER ON SPECIALIZATION OF PARASITISM IN THE ERYSIPTACEAE, II, is printed in the *New Phytologist*, 3:109-121, May 1904. It gives the results of further inoculation experiments, carried out the preceding summer, in which conidia were used of the following species, *Erysiphe graminis* DC. on four hosts; *Sphaerotheca humuli* (DC.) Burr. on one host; *S. humuli fuliginea* (Schl.) Salm. on two hosts; *E. cichoriacearum* DC. on one host and *E. galeopsidis* DC. on one host. The results obtained seemed to show that in every case the form of the fungus used has become specialized into a "biologic form."

THE REPORT OF THE STATE BOTANIST 1903, NEW YORK MUSEUM, by Charles H. Peck, forms Bulletin 75 (Botany 7), 1904. This is a pamphlet of 84 pages and four double page colored plates. The mycological part consists of descriptions of thirteen new species of the higher fungi, also two new varieties besides others listed as new to the State; under the head of Edible Fungi seven mushrooms are fully and popularly described and illustrated. This Bulletin can be obtained from the Director of the Museum (Albany, N. Y.) for 40 cents.

THE INTRODUCTORY PART OF THE ARTICLE BY ERNEST S. SALMON, On *Erysiphe Graminis* DC. and its adaptive parasitism within the genus *Bromus*, *Annales Mycologici*, 2:255-266, Mai 1904, presents general considerations on the subject of the interrelations of 'biologic forms' and host-species. He says: Now the facts show not only the high degree of specialization reached by the fungus in its adaptive parasitism to the various species of *Bromus*; but also that *each species of Bromus possesses distinctive physiological (constitutional) characters existing concomitantly with the specific morphological characters*. These physiological characters are constant, and render the species susceptible or immune in a definite manner, so that the various species of *Bromus* according to their constitution — if one may use the term — behave differently to the attack of the 'biologic forms' of the fungus.

THE JANUARY NO. OF THE JOURNAL OF MYCOLOGY (1904) gave the following: Morgan — A New Sirothecium; Hedgcock — Proof of the Identity of *Phoma* and *Phyllosticta* on the Sugar Beet; Atkinson — Notes on the Genus *Harpochytrium*; Arthur — Cultures of Uredineae in 1903; Kellerman — Notes from Mycological Literature, VIII; Index to Uredineous Infection Experiments; American Mycological Society.

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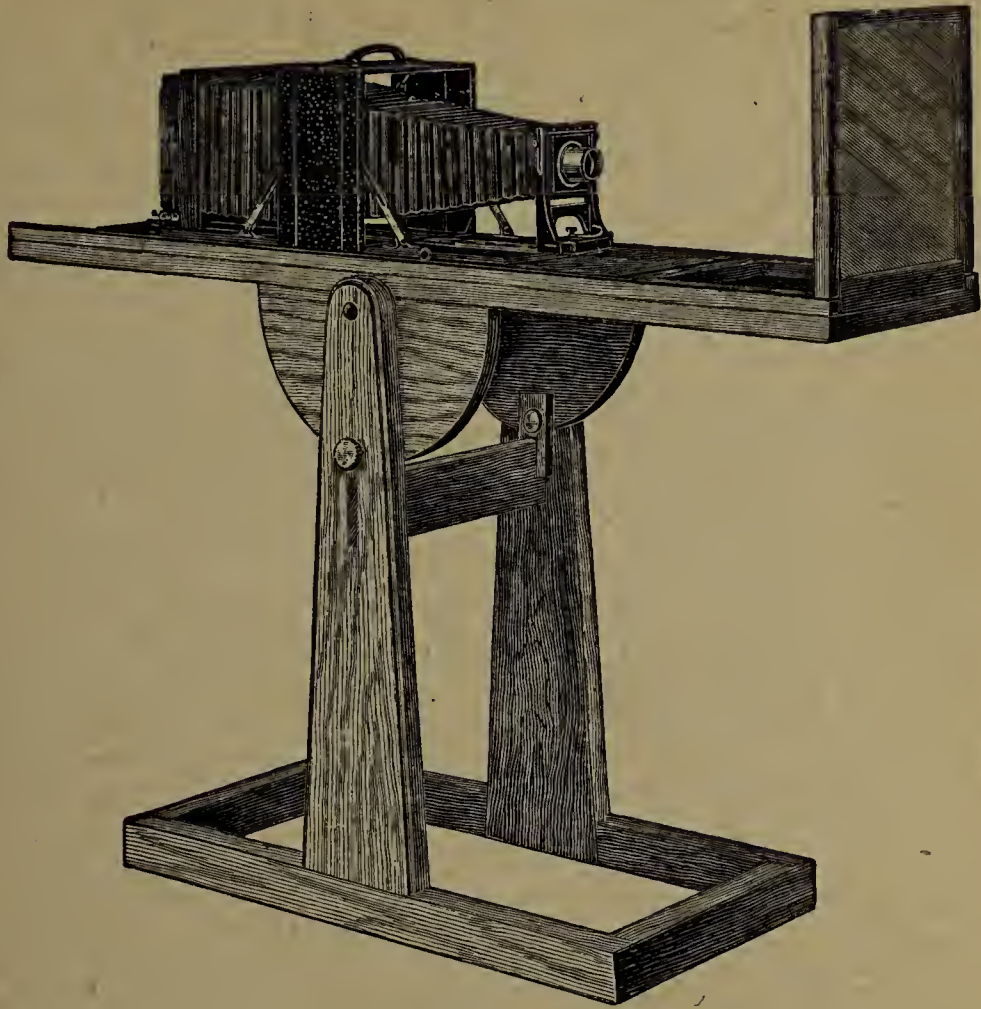
In Mycological Notes, No. 18, C. G. Lloyd comments as follows: Dr. Hollos writes by the column when he thinks he sees an opportunity to juggle up a new combination. . . . But he takes the strange stand, for one who uses "priority" as his chief excuse to juggle names, that *Secotium erythrocephalum*, which he claims is the same plant and an earlier name, cannot be used because it was based on young specimens of the plant. There is logic! Any kind of an old vague picture serves him as an excuse to change names, if he can write "Hollos" after the "new combination," but he holds that he must not use Tulasne's earlier name, because Tulasne had young specimens. So he conjures up a *subsequent* name, and devises a new combination, to which. . . .

We owe much to Mr. Lloyd who has never failed to wield his pen trenchantly when vagaries and inconsistencies are practiced in the zeal to establish a stable nomenclature. We do not believe that the principle of "priority" can be dethroned, but we do commend the view taken above, namely, that it is absurd to attempt to overthrow a name because "*based on young specimens!*"

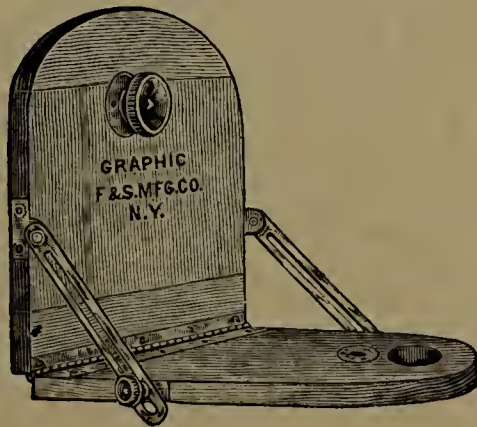
Again, Saccardo says: The proper name of one of the *Uredinaceae* is that applied to the teleutosporic stage, the secondary name is that given to one of the earlier stages (*Uredo*, *Epithea*, *Caeoma*, *Aecidium*, *Aecidiolum*). Moreover, when the name of an earlier stage of any species is found to have been published before the name of the correlated perfect stage, it is not permissible to transfer the name of the imperfect stage to the perfect one upon the plea of priority, unless the former is found to comprise the perfect stage also, as often happens in *Uredo*, with respect to species of *Uromyces*, *Puccinia*, *Coleosporium*, etc.

What is the difference? In one case the specimens were "young" — hence throw away the name! In the second case the specimens were "*imperfect forms*" (YOUNG?) — but then throw away the name! That kind of "priority" precludes stability in nomenclature.

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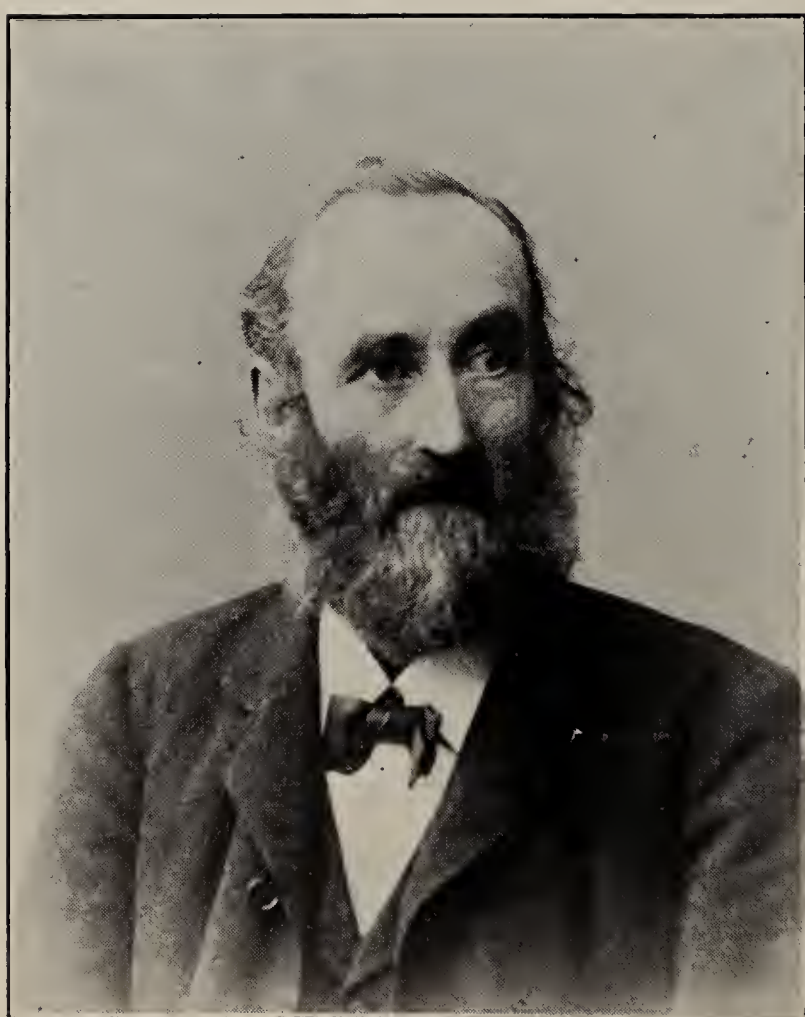
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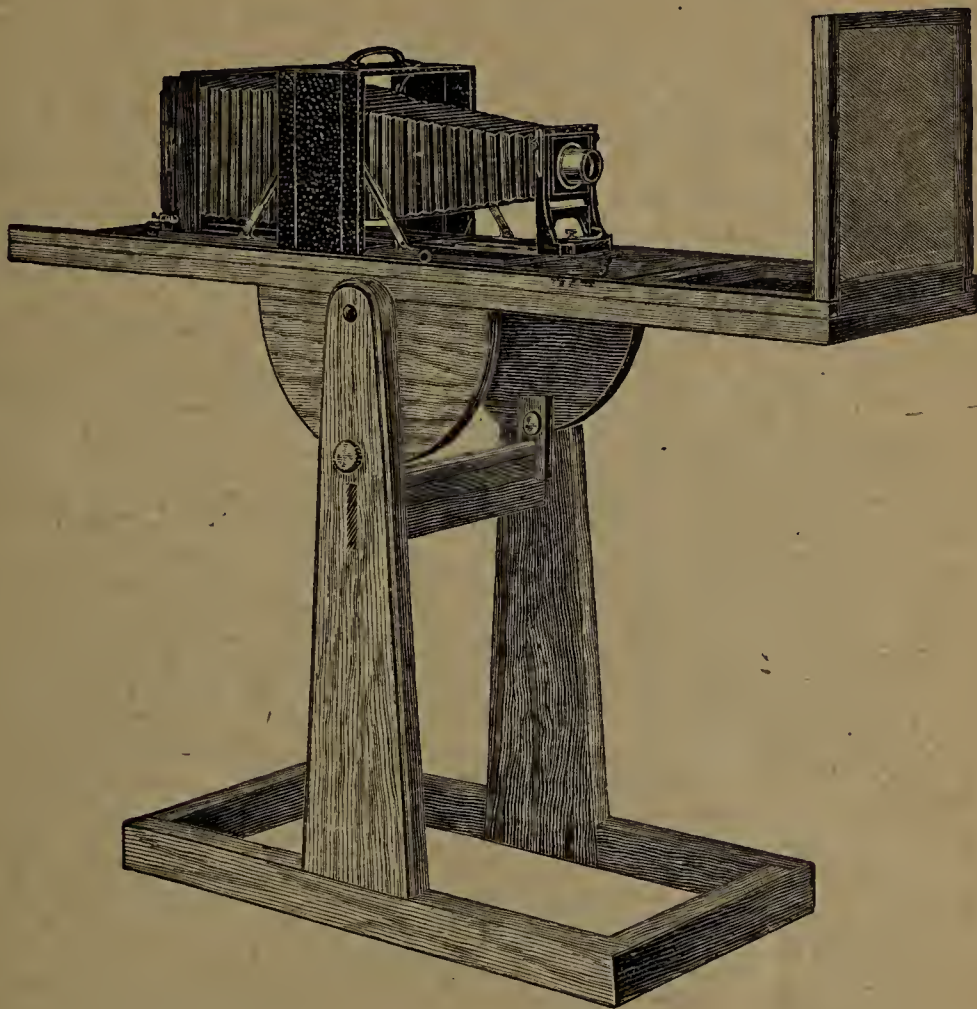
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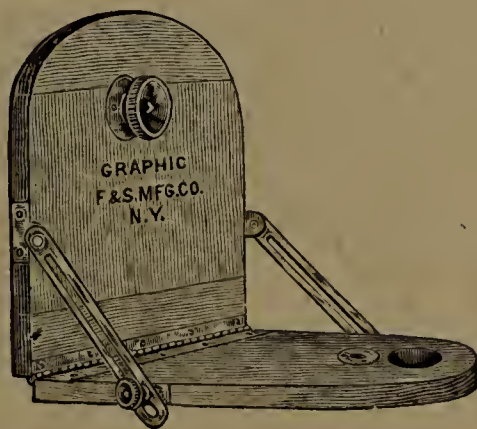
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